



HERE'S P&H LEADERSHIP AGAIN... *Magnetorque AC Crane Control*

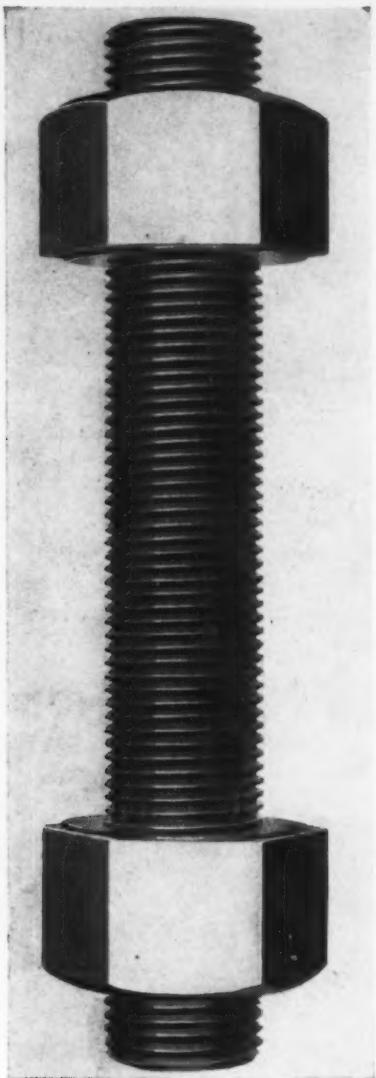
The new Magnetorque Control for AC Cranes is another outstanding example of P&H's leadership. . . . It exerts braking forces electro-magnetically — without friction — without wear. It provides the smoothest, most accurate control ever put on an Overhead Crane . . . under all load conditions. It eliminates the old mechanical load brake and all the maintenance that goes with it. And it does all this with the convenience of existing AC power supply.

Wise crane buyers are not missing the advantages of the Magnetorque. It is but one of many P&H Added Values.



MAGNETORQUE
CRANE CONTROL
is another P&H
Added Value.

OVER 16,000 P&H CRANES SERVE AMERICAN INDUSTRY . . . FAR MORE THAN ANY OTHER



ERIE

Specialists for
36 YEARS... in
P R E C I S I O N
H I G H Q U A L I T Y
A L L O Y
S T U D S

Send your blueprints to



Fatigue Cracks

By *Charles T. Post*

Metal Show

All things considered, last week's National Metal Show ran smoothly. The usual number of delegates found themselves without hotel accommodations and the usual number of urchins sneaked past the show guards to cart off bundles of technical literature.

Westinghouse's highly publicized talking Mynah birds drew the expected crowds, but if they said "Westinghouse" or even "GE" the chatter of the crowds drowned it out. When we stopped by, they were being interviewed by a woman newspaper reporter, but when they opened their beaks all that came out was a raucous wolf whistle. The lady reporter was well into her middle years, and this seemed to please her hugely.

Biggest backfire came at an elaborately prepared aluminum exhibit. Feature attraction was to be an educational lecture on the metal's virtues by a young lady whose glitter outshone the metal and whose curves were better formed than anything else in the show. Her model agency training did not include aluminum metallurgy, so it was arranged that she should stand on the platform, turn the cards on a display easel, and let her lips form words which were fed into the p.a. system from a recording. Half way through the spiel, she missed her cue, became flustered by the chuckles from the audience, stamped her foot and grabbed the microphone.

"Damn these salesmen, I can't sell aluminum," she enunciated clearly, and walked off the plat-

form. The recording droned on sweetly as to the virtues of the light metal. We assume the young lady was given duties better suited to her talents for the balance of the show.

Dark Angel

For a moment only the grim reaper threatened to move into steel strike headlines last week. When the strike started, a customer's dies for washing machine parts were stranded in one of Republic Steel's strikebound plants. Owner of the dies wanted to move them to its own plant so production could continue. This took a writ of replevin from the local courts and an assist from the sheriff.

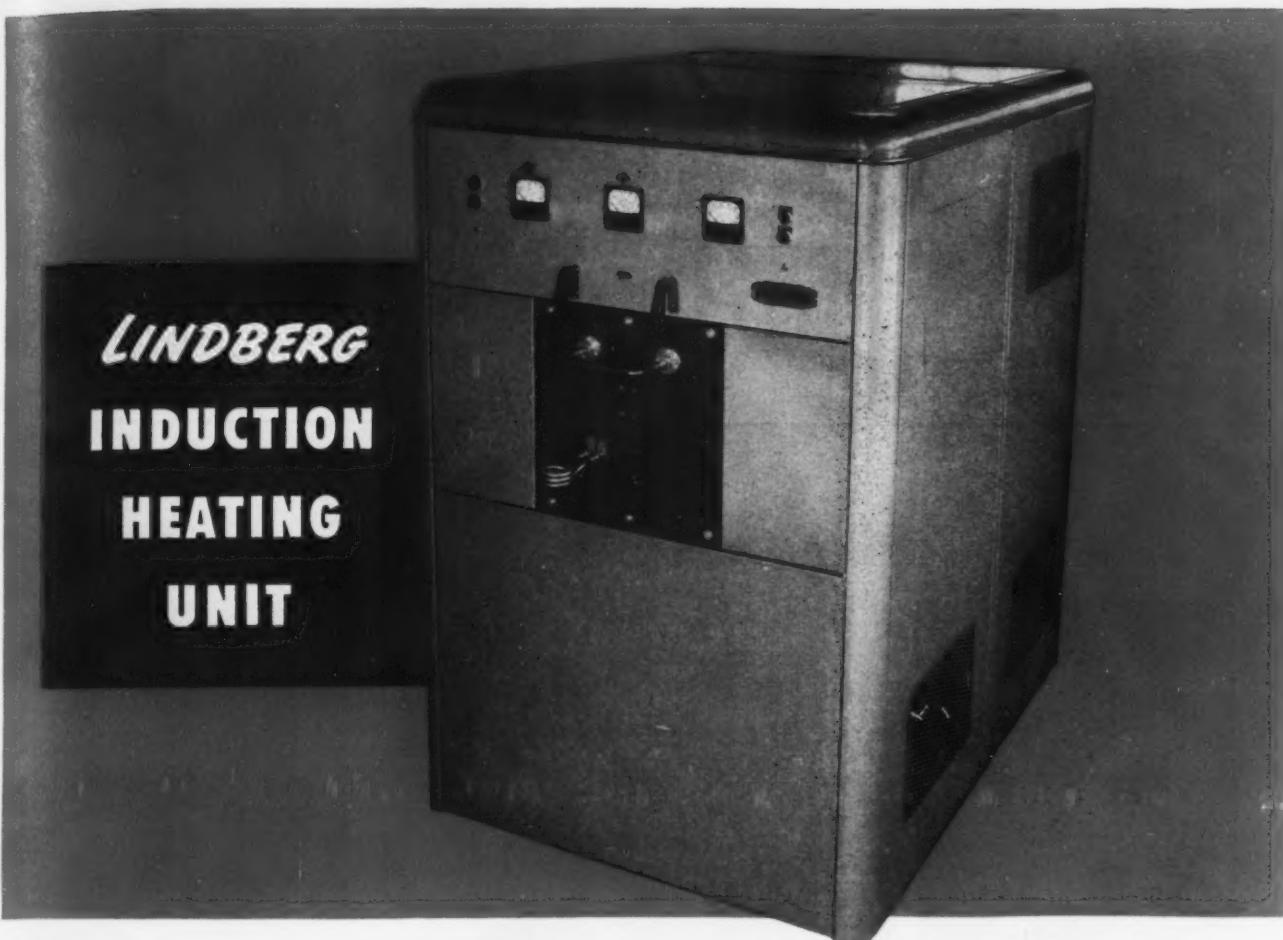
With a sigh of relief, Republic's executive-in-charge rushed to dictate a report on this development, headed by the line, "Customer dies removed from plant on court order." His secretary transcribed the report in a flash, handed it back to him with the neatly typed heading: "Customer dies, removed from plant on court order."

Trucking

Object though you may to increasing freight rates, you'll have to admit that the railroads are exploring every possible source of additional revenue.

Latest addition to the dining car order slips is a small space for advertising at the bottom. On the New York Central run from Chicago to Cleveland, as soon as you finish writing your order for bouillon,

Turn to Page 129



**LINDBERG
INDUCTION
HEATING
UNIT**

**NEW and EXCLUSIVE developments
in induction heating...**

Available in single and two-station models the Lindberg LI-25 is ideal for hardening, brazing and soldering, annealing and stress relieving, hot forming and light forging, shrink fitting and other induction heating applications.

The Lindberg LI-25 is a ruggedly constructed vacuum-tube type unit for hard working production line jobs. Oscillator tube, power transformer and other major components deliver a full 25 KW with plenty of reserve to insure dependable day in and day out performance. Well designed—safe and simple to operate—featuring the most desirable developments in high frequency heating.

CONDITIONED COOLING—Built-in to increase tube life, eliminate harmful condensation and scaling, reduce water pressure and consumption —can be used with hard water. Rubber hoses are completely eliminated.

"CHECKLITE"—a unique feature exclusive with this unit, makes servicing easier, reduces maintenance costs.

AUTOMATIC CONTROL—when job cycles are set, automatic timer controls every phase of the operation—heat, quench, fixture movement.

SAFE AND SIMPLE—both operator and operating parts are protected—filament voltages are constantly regulated—tank capacitor is hermetically sealed—work coils protected against burn out. Every unit certified to meet FCC regulations. For detailed information write for Bulletin T-1420.

See the Lindberg display at the
National Metal Show, Cleveland,
October 17-21—Lindberg Booth #1509

LINDBERG HIGH FREQUENCY HEATING

A DIVISION OF LINDBERG ENGINEERING CO.
2452 West Hubbard Street, Chicago 12, Illinois

Iron Age Introduces



HARRY L. SPENCER, vice-president in charge of manufacturing, Norge Div., Borg-Warner Corp.



ROY C. MENZEL, Secretary-treasurer, General Metals Corp.



PHILIP B. NILES, Vice-president, Yale & Towne Mfg. Co.

Harry L. Spencer has been appointed vice-president in charge of manufacturing Norge Div., BORG-WARNER CORP., Chicago. Mr. Spencer rejoined the company in 1948 after five years with the Bendix Home Appliances, Inc.

William O'Neil, Jr., has been appointed plant manager of the Bowling Green water cooler plant, air conditioning dept., GENERAL ELECTRIC CO., Bloomfield, N. J. Prior to his appointment, Mr. O'Neil was supervisor of the personnel and wage rates section of the Winter Street Plant, Fort Wayne, Ind. **David M. Rush** has been made materials engineer of the manufacturing division in the company's air conditioning department. Mr. Rush was formerly engaged in special assignment work, serving as a

member of the staff of the manager of manufacturing.

Roy C. Menzel has been appointed secretary and treasurer of the GENERAL METALS CORP., Oakland, Calif. Mr. Menzel has been associated with the company for the past 25 years.

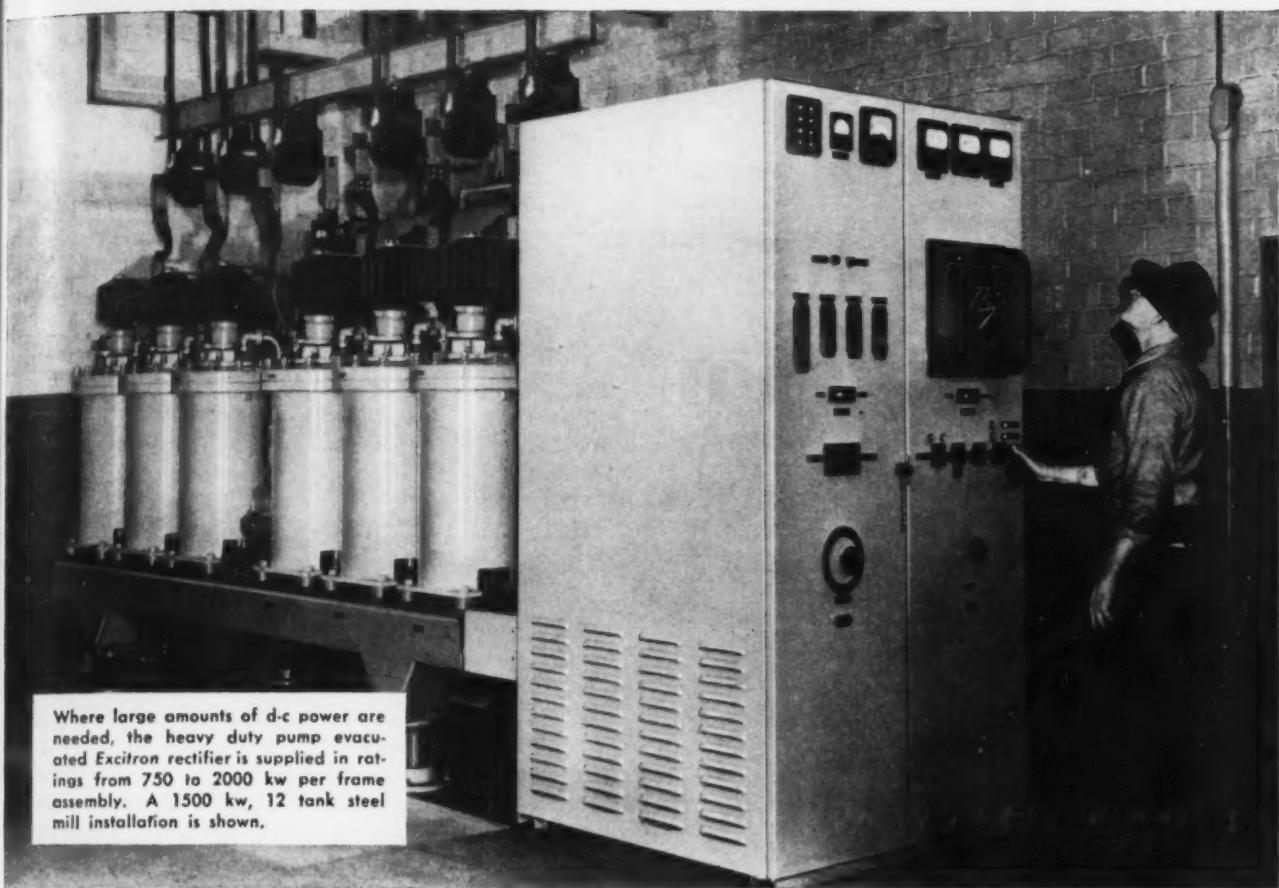
Robert B. Marsand has become executive vice-president and general manager of the two affiliate companies, STRUCTURAL IRON & STEEL CORP. and INDUSTRIAL MATERIALS EXPORT CORP., both of Newark, N. J. Mr. Marsand was formerly connected with Bethlehem Steel Co.

Alan Ede has been appointed resident salesman, KAISER STEEL CORP., Stockton, Calif., and will serve the northern California area.

Philip B. Niles has been elected a vice-president of the YALE & TOWNE MFG. CO. Mr. Niles will join the company on November 7, and devote his attention to marketing and to the development of executive personnel throughout the organization.

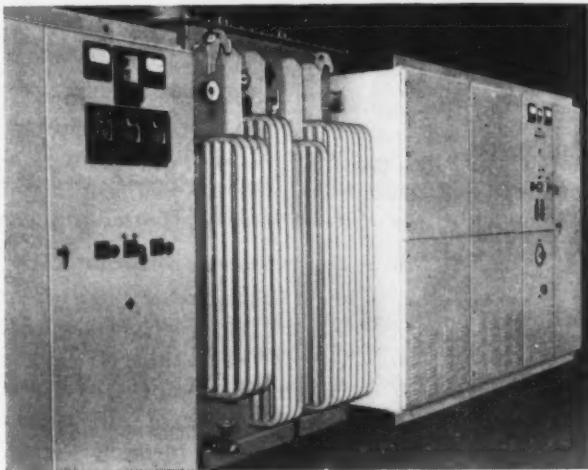
John E. Charleson has been appointed superintendent of the finishing department, Stamford Div., YALE & TOWNE MFG. CO., Stamford, Conn. He succeeds **James F. Manning**, who has retired after 47 years of service with the company.

Arthur Kuiper has been appointed treasurer of the CONTINENTAL FOUNDRY & MACHINE CO., to succeed **W. L. Spencer**, who has retired. Mr. Kuiper was formerly comptroller for the company.



Where large amounts of d-c power are needed, the heavy duty pump evacuated Excitron rectifier is supplied in ratings from 750 to 2000 kw per frame assembly. A 1500 kw, 12 tank steel mill installation is shown.

A-C Converts Power to D-C Right Where You Use It!



For smaller ratings and smaller load centers, Allis-Chalmers builds the sealed tube, factory assembled and packaged Excitron rectifier in ratings from 200 to 500 kw at 250 volts d-c.

TODAY'S COST IMPORTANCE is speeding the use of mercury arc rectifiers to supply general purpose 250 volt d-c power for steel mills. *Excitron* rectifiers can readily be placed right at the true d-c load center. Long, power-wasting d-c feeders are eliminated and voltage regulation and distribution efficiency are improved.

Excitron rectifiers are cheaper to operate and maintain than M-G sets. There are no problems of commutator and brush wear. No attendants are needed. Conversion efficiency is higher at all loads. Power savings are especially large where machine load factor is low and during long light load or idling periods.

A qualified Allis-Chalmers steel mill representative will be glad to further explain how *Excitron* rectifiers can benefit your operations. Call your nearest A-C sales office or write direct.

A-2821

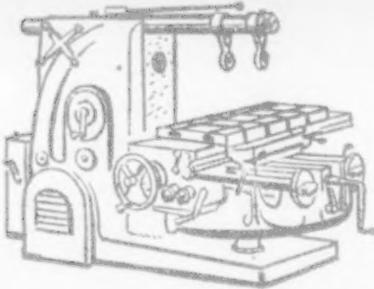
ALLIS-CHALMERS, 1019A SO. 70 ST.
MILWAUKEE, WIS.

Excitron and *Ruptair* are Allis-Chalmers trademarks

ALLIS-CHALMERS

Power, Electric, Processing Equipment for Iron and Steel





MACHINE TOOL High Spots

SALES, INQUIRIES AND PRODUCTION

Cleveland—While some segments of the machine tool industry were managing to maintain a buoyant attitude this week despite the steel strike and the outspoken pessimism of many industry leaders, the effect of the strike as a sales depressant could not be ignored.

In Cleveland, the preliminary index of new orders and shipments of machine tools reported by National Machine Tool Builders' Assn. showed a 6.2 pct increase in new orders during September. The September order index was 57.7 pct compared with 51.5 pct in August. Foreign orders declined to an index of 13.7 pct from 18.8 pct in August. Index of September shipments was 67.6 pct compared to 67.3 pct in August.

Detroit Prospects Good

Ratio of unfilled orders to shipments declined from 3.8 pct to 1 pct in August. This situation has changed materially within the past week. Major segments of the industry report October order volume is fading, and with it, perhaps, the fall revival in business that 3 months ago seemed to be in store for machine tool builders.

An exception this week was Detroit, where despite a tendency

by

William A. Lloyd



**Industry leaders pessimistic . . .
October order volume fading . . .
Detroit prospects promising.**

of some firms to stand still as a result of the coal and steel strike, prospects for the machine tool industry in the motor capital during the fourth quarter are highly promising.

Chrysler activity has been particularly impressive, involving each of the Chrysler divisions for product improvement equipment in addition to the V-8 engine program. During the past week tooling for block parts as well as drilling and other equipment has been quoted on by local suppliers.

At the moment, activity is on the slow side, although some orders have recently been placed, it is reported, by Buick and Bay City plants.

Buffalo Equipment Ordered

With press equipment for its Buffalo stamping plant now on order, Ford is turning its attention to equipment such as radial drills and planers for the Buffalo press setup. Recently the company has introduced a system of "letters of intent" in placing its machine tool orders.

Local suppliers are watching with interest for developments concerning Kaiser-Frazer, but nothing conclusive has been reported as yet.

ECA Allocates \$160 Million

In Washington, Marshall Plan countries have been allocated a total of \$160 million for purchase of machine tools and metalworking machinery in the first 18 months of the European aid program.

Authorization of \$10 million in September for procurement of machine tools brought the cumulative total to \$75 million, almost entirely from American factories.

September allocation of \$24 million brought the total amount for metalworking machinery to \$86 million.

Through September, about \$15 million worth of machine tools and \$18 million worth of other metalworking machinery—or 20 pct—had been shipped, according to ECA records.

Buys Canedy-Otto Business

In Cincinnati, acquisition by Cincinnati Lathe & Tool Co., a wholly-owned subsidiary of Cincinnati Milling Machine Co., of the line of upright sensitive and radial drilling machines formerly produced by the Canedy-Otto Mfg. Co., Chicago Heights, Ill., was announced.

The amount involved in the transaction between Cincinnati Lathe & Tool Co. and Canedy-Otto was not revealed in the announcement by Millard Romaine, president of Cincinnati Lathe & Tool Co.

This is another of the
"HUNDREDS OF JOBS"
which can be done only on a
MARVEL Band Saw!



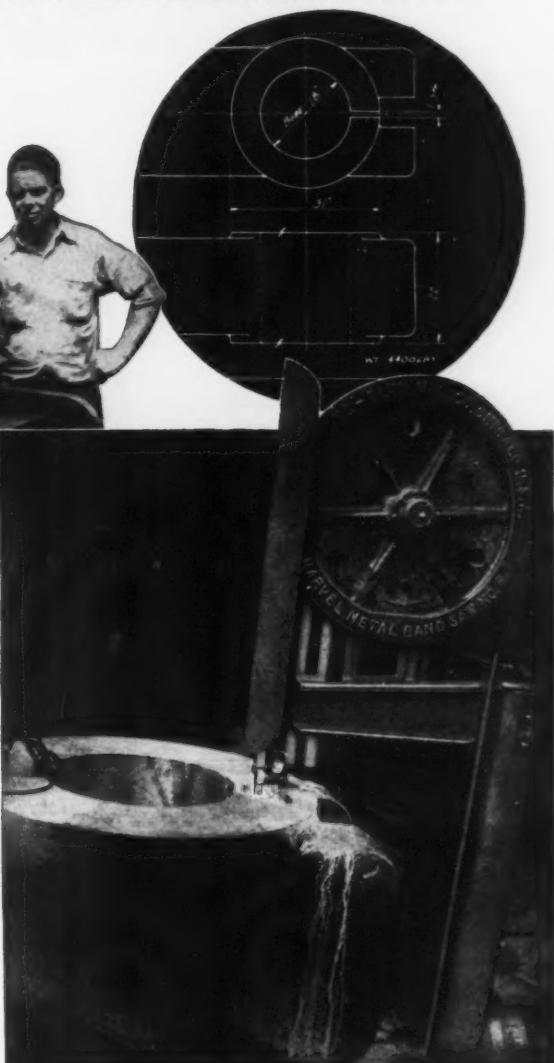
MARVEL BAND SAW saved these two 4400 lb. castings

Two sand cores washed out when these giant 4400 pound steel connecting rods were cast, resulting in solid eye ends without gaps. Then came the \$64 question—how to machine out the 1½" slots in the longitudinal center of the eyes which were 22" high and had a wall thickness of 6½".

The Ernest J. Nelson Iron Works of San Francisco, did this "impossible" job easily, quickly and economically, without special tooling, on a standard Model #8M/2 MARVEL Band Saw. Two cuts were made in each rod in two hours per cut with tool cost of \$3.06 per rod. The tool was a MARVEL B9-10 Band Saw Blade.

Every tool room, machine shop and maintenance department needs a MARVEL Series 8 Universal Band Saw—not only for innumerable everyday jobs but for the occasional "trick" operations, where its utmost versatility will save many headaches and dollars.

WRITE FOR CATALOG



**These exclusive MARVEL Features
made this job easy!**

1. Large, T-slotted work table.
2. Blade feeds into work vertically; work always stationary.
3. Power-pressure feed.
4. Automatic blade tension.
5. Built-in coolant system.
6. Large capacity.

MARVEL Metal Cutting
SAWS.
Better Machines-Better Blades

ARMSTRONG-BLUM MFG. CO.
5700 BLOOMINGDALE AVENUE
CHICAGO 39, ILLINOIS



—FREE

USE POST CARD

PUBLICATIONS

Telemetering Systems

The newest GE telemetering equipment for electric power distribution and industrial applications is described in GEA-5233, a 20-p. illustrated bulletin. *General Electric Co.* For more information, check No. 1 on the postcard.

Drop-Bottom Skid Boxes

Drop-bottom skid boxes, eight-way all-steel pallets and multi-purpose material handling accessories are described and illustrated in 12-p. pamphlet. *Monroe Auto Equipment Co.* For more information, check No. 2 on the postcard.

Aluminum Ladders

Folding step ladders, warehouse ladders, and straight ladders are illustrated and described in 12-p. folder. Also included are price lists, weights and tables of specifications. *Aluminum Ladder Co.* For more information, check No. 3 on the postcard.

Reversing Vane Pumps

The new series of B&S automatic reversing vane pumps is described in 8-p. pamphlet. Included are illustrations, construction details and selection charts. *Brown & Sharpe Mfg. Co.* For more information, check No. 4 on the postcard.

Magnetic Separators

A new 8-p. bulletin describes Dings electric and non-electric magnetic pulleys, non-electric magnetic drums, triple pole rectangular

New publications that describe money saving equipment and services are available free and without obligation. Copies can be obtained by filling in the attached card and mailing it.

magnets, lifting magnets, non-electric plate magnets and high intensity induced roll and cross belt magnetic separators. *Dings Magnetic Separator Co.* For more information, check No. 5 on the postcard.

Air Cylinders

Complete data including dimensional drawings are presented in 12-p. bulletin on Power Dome non-rotating, double-acting air cylinders. *The Bellows Co.* For more information, check No. 6 on the postcard.

Loading Lifts

This new bulletin gives information on the uses and advantages of Adjust-A truck and dock loading lifts. *Rowe Methods, Inc.* For more information, check No. 7 on the postcard.

Helical Gear Drives

Engineering manual MPA describes the new line of Maxi-Power enclosed helical gear drives, giving complete ratio information, horsepower rating tables, simplified selection procedure, overhung load capacities, assembly diagrams and dimensions and weights of single,

double and triple speed reduction units. *Foot Bros. Gear and Machine Corp.* For more information, check No. 8 on the postcard.

Chain Selection Chart

Complete data on alloy and iron chains and the working load limits of sling chains in 9/32 to 1 in. sizes are given in chain selection wall chart whose high-gloss finish makes it a lasting shop reference. *McKay Co.* For more information, check No. 9 on the postcard.

Refractory Ware

Newly published 24-p. catalog describes zircon-base refractory ware for the metallurgical and allied industries. Illustrations, selection charts and price lists are included. *Laboratory Equipment Corp.* For more information, check No. 10 on the postcard.

Industrial Desks

New 12-p. catalog describes line of metal drafting desks, office desks, typewriter tables, special salesmen's desks, shelf and leg-type tables, single and double pedestal desks, flat-top and secretarial desks, fixed-bed and overhang desks, as

Turn to Page 116



When These 6,377 Fasteners Pay Off!

Dark sky . . . wind . . . devastating rain mean there's no time to lose. So you give 'er everything she's got and pray you'll get in most of the crop before it's too late. That's when the holding power of the 6,377 fasteners in this combine really pay off.

1867 bolts . . . 415 cap, set and tapping screws . . . 1840 rivets . . . 2255 nuts form the steel network that locks the framing members of this combine together.

Because these fasteners are call-

ed upon to hold their own on a rugged day-in and day-out schedule, top quality is essential. That's why Russell, Burdsall and Ward with 104 years' experience still carries on intensive research and development work to improve fastener holding power further.

It is unsound economy to use inferior fasteners, since the price of fasteners is such a small part of the total product cost. It isn't the initial price but the cost of *using* fasteners that counts.

To attain True Fastener Economy, you can save assembly time, reduce plant inspection, and get the maximum holding power per dollar of fastener cost with a dependable quality fastener. True Fastener Economy contributes to the kind of production savings that put more and more combines on U. S. wheatfields every year. It is this type of contribution to major American industries that explains why—for over 104 years—RB&W has been *making strong the things that make America strong*.

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

RB&W



Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Cal. Additional sales offices at: Philadelphia, Detroit, Chicago, Chattanooga, Oakland, Portland, Seattle. Distributors from coast to coast.

6,377 Fasteners are used in 1 American Combine



104 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

NEW

PRODUCTION IDEAS

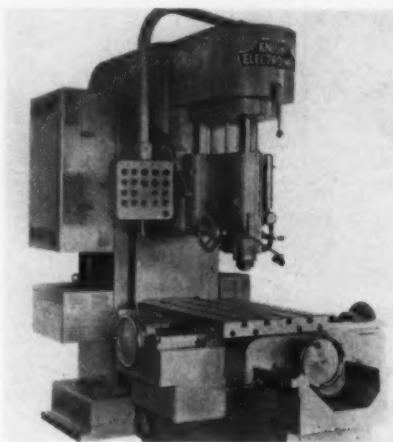
Continued

Air-Van is a low silhouette design and can be furnished in special metals. *Gallagher Co.* For more information, check No. 30 on the postcard on p. 35.

Milling Machine

A new Electromill for heavy duty vertical milling, drilling and boring provides wide latitude in selecting various features to meet specific requirements. The machine may be equipped with variable speed motors for wide versatility or with constant speed motors for specialized production work. Motors can be changed to suit changing work conditions on milling, drilling, boring, routing, experimental or production work. The table and saddle travel on rollers and are designed to eliminate overhang. Both table and saddle handwheels can be operated simultaneously. The column has an unusually deep throat and a spindle head with

extra long quill. A V-belt drive and built-in flywheel with variable speed range provide smooth opera-

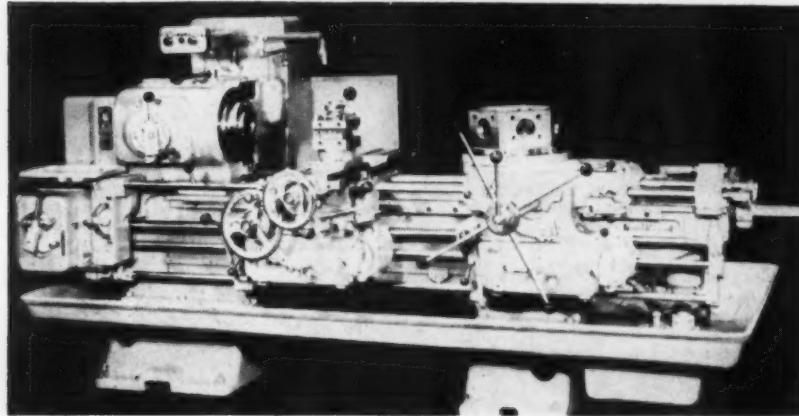


tion. Speed and feed changes are electronically controlled, an increase being possible while the machine is in operation. A safety switch stops power drives and

Universal Turret Lathe

The 7A saddle type universal turret lathe with 2½ in. bar and 12 in. chuck capacity is a completely redesigned model weighing over 4½ tons without tooling. It combines the construction and control features of the previous model, with improvements and refinements designed to provide the optimum in rapid, low cost, metal removal. Threading to maximum turning length with carriage or saddle is

possible because of the full length lead screw. An all-sliding-gear, quick-change gear box with a single lever pitch selector, provides a wide range of pitches. Both cross slide and saddle are equipped with powered rapid traverse, and the turret is power indexed. Two ranges of 12 spindle speeds, 20 to 1000 rpm or 30 to 1500 rpm, are available, with a constant speed motor. *Jones & Lamson Machine Co.* For more information, check No. 32 on the postcard on p. 35.



safety clutches prevent jamming feed or overloading drive. *W. B. Knight Machinery Co.* For more information, check No. 31 on the postcard on p. 35.

Broaching Machines

New ram-press broaching machines may be used interchangeably for conventional broaching operations, including surface broaching, internal push - broaching, slotting and presswork. They are available in 4, 6 and 10-ton capacities, with 24 and 36-in. strokes. Columns are heavy welded steel, with hardened and ground ways the full length of the column for the ram slide. The hydraulic system provides excess capacity for occasional overloads. The coolant system has its own separately motorized impeller type pump. A large bracket bolted to



the ram face is for internal push broaching and for single or multiple assembly and presswork. *Colonial Broach Co.* For more information, check No. 33 on the postcard on p. 35.

Drilling Machine

The new heavy duty, full-universal Kaukauna drilling and tapping machine provides 97 in. radial reach and will drill holes at any point from 18 to 134 in. above the floor. It is capable of performing all radial, horizontal or angular operations such as drilling, tapping, boring, spotfacing, or reaming on a production basis; and can be supplied for stationary fixed-location applications or for portable use. It has a 4-in. diam spindle with 18 in. of manual and power feed, and

Turn to Page 120

W. B.
more
in the

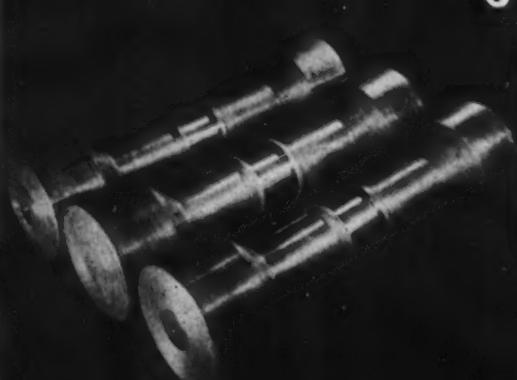
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MESTA

Forgings

From the selection of raw materials to the accurately machined finished product, every step in the manufacture of Mesta forgings is under rigid control to assure consistent high quality. Mesta Forge Shops produce carbon and alloy steel forgings in all sizes, up to the largest used by industry.

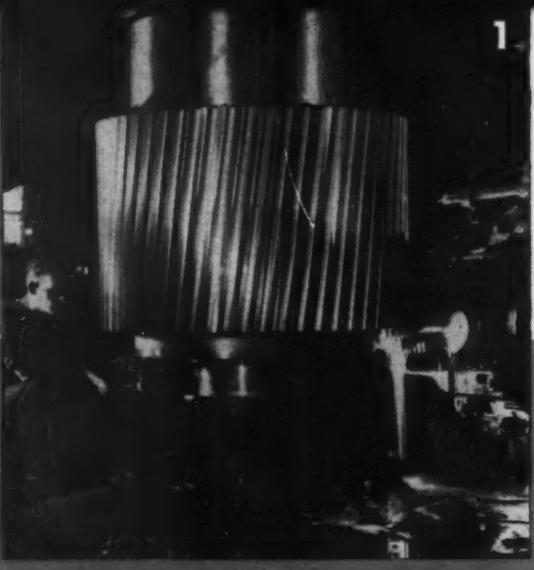
Write for descriptive
forging literature.



3



4



1

- 1 Forged steel single helical cut tooth pinion for vertical edging aluminum rolling mill.
- 2 Group of forged steel coupling halves.
- 3 Group of semifinished forged steel spindles for four-high continuous strip mill.
- 4 Forged steel gears for four-high skin pass mill feed reel.

MESTA
MACHINE CO.
PITTSBURGH, PA.

On the ASSEMBLY LINE

AUTOMOTIVE NEWS AND OPINIONS

Auto industry sets new all-time production record . . .

Steel strike may delay introduction of new models . . .

Ford to discontinue assembly operations Nov. 15.



by

Walter G. Potter

Detroit—During the week ended Oct. 7, the auto industry turned out its 5 millionth 1949 model vehicle in U. S. plants. The present outlook is that on or about Oct. 26 the industry will have established an all-time high for U. S. motor car production. The previous record for any single year was 5,358,420 cars and trucks assembled in U. S. plants during the entire year 1929.

At the moment, it looks like the coal and steel strikes will not seriously interfere with auto production before the end of October. Up to the present time there have been only minor interruptions to auto production that are attributable to steel shortages. An auto producer is reported to have been called on to furnish a substantial tonnage of hot-rolled to a frame supplier who had run short of steel.

As a general rule, however, auto parts suppliers are not calling for assistance as frequently as might have been expected. Local steel representatives have not found the pressures as strong as they had anticipated. There is no assurance, however, that this condition will continue for very long in the face of a steel and coal stoppage.

Shortages to Halt Production

Informed local observers believe that the final week in October may well be the last full week of auto production, assuming the steel and coal strikes are still in effect. After that time, auto output is expected to taper off rapidly with few companies attempting to continue 5-day assembly operations. By Nov. 15 shortages of parts or basic raw materials are expected to halt most of the automotive assembly lines, including some companies that may have anticipated a longer period of operation.

Model Changes Expected To Be Delayed by Manufacturers

Two results from the steel strike now appear to be inevitable: (1) New model introductions scheduled for later in the year are likely to be delayed, and (2) auto steel buying will go back on a quota basis.

It is standard practice, of

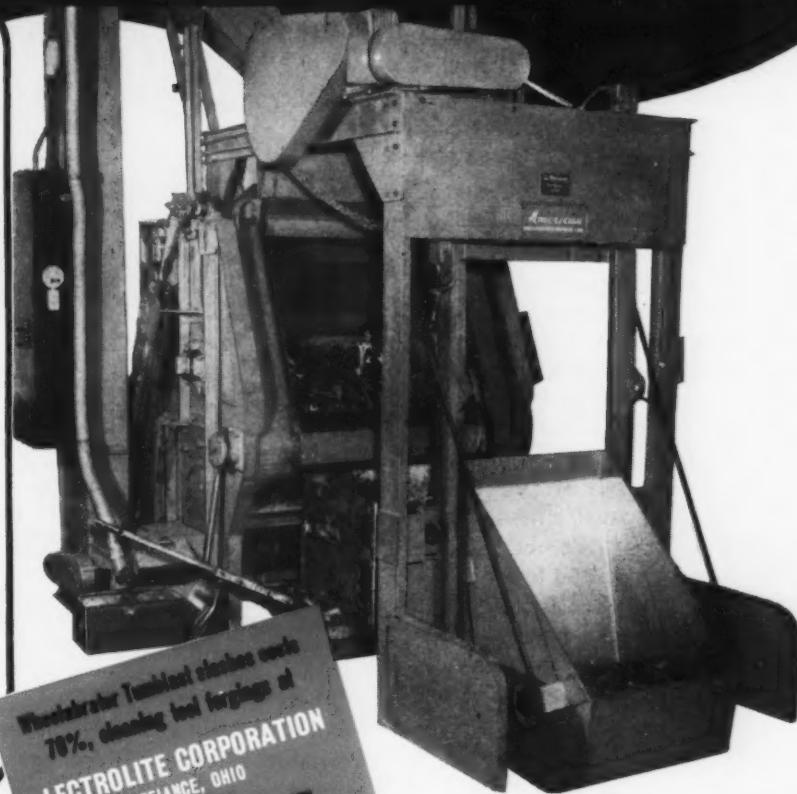
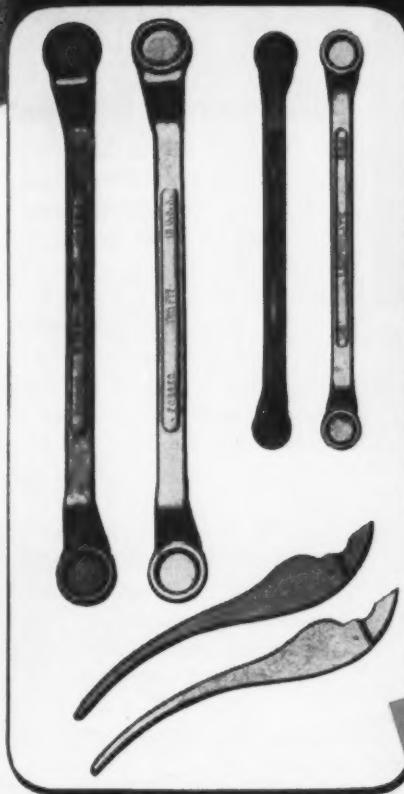
course, for auto executives to decide on the number of cars to be included in a model run. After establishing schedules a car producer is often forced to change the timing but it is generally expected that every reasonable effort will be made to complete the model run as originally planned. Usually parts are on hand to complete the schedules and costs are estimated on the basis of the completed model run.

It may be expected, therefore, that in many cases car manufacturers will delay their new model introductions in order to complete the schedules originally set up.

Will Make Minor Changes

Many of the model changes coming up later this year or early in 1950 will be "face-lifting" changes. It is expected that Ford, Chevrolet, Pontiac, Olds 6, the several Chrysler lines, Hudson and Packard will make only minor changes in their present models. New models are expected to include the entire Cadillac line of cars, the Olds Futuramic, Buick Super and Roadmaster. It is also probable that the Olds 88 body will be shifted from the present General Motors "A" group to the GM "B" group. Each of the GM cars which is undergoing a major body change this year uses a GM "C" body. Other changes in the GM line of cars include the addition of other body

Superior Forgings at $\frac{1}{3}$ the Cost...
SPEED CLEANED WITH WHEELABRATOR®



Picture above graphically illustrates the thoroughness of the Wheelabrator. Notice the gleaming finish of the forgings after Wheelabrating. Wheelabrator makes plating easier, faster, better, by cleaning forgings down to virgin metal.

In thousands of installations, the Wheelabrator has proved itself to be a profitable investment. Through direct savings in labor, time and power, faster production and cleaner forgings at lower costs, it easily pays for itself in an amazingly short time.

At the Lectrolite Corporation, for example, a Wheelabrator tumblast slashed the costs of cleaning tool forgings 65 to 70%. It replaced two blast barrels and a tumbling mill and produced twice as many forgings in less than one-half the time . . . over fourteen tons of pliers, wrenches and tire tools are cleaned by the Wheelabrator in an eight hour day. Forgings are cleaner, making chromium plating easier and more durable without the necessity of subsequent surface treatment. Investigate the cost-cutting performance, high-speed production and bonus benefits of the Wheelabrator. Write for the new catalog described below.



New, informative book gives complete, concise information on all phases of airless blast cleaning. Write today for Catalog No. 74-A.



American
WHEELABRATOR & EQUIPMENT CORP.

510 S. Byrkit St., Mishawaka 3, Indiana

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT

Wheelabrator 36" x 42" Tumblast cleans 650 lbs. or 1600 open-end wrenches in approximately 5 to 8 minutes. Two blast barrels and tumbling mill took forty minutes to clean only 400 pounds, or 975 pieces.

COMPARE THESE FIGURES

FORMER METHOD	WHEELABRATOR METHOD
EQUIPMENT	EQUIPMENT 36" x 42" Wheelabrator Tumblast (1½ cu. ft. capacity)
2 Blast Barrels 1 Tumbling Mill	PRODUCTION 14 to 15 tons in 8 hrs.
9 to 10 tons in 16 hrs.	LABOR 16 man hours

SAVINGS

Cost figures prove that Wheelabrator cut costs 65 to 75%. Repays investment in two years.

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AGE

styles to the Buick Special and introduction of a new Cadillac at a price lower than any of the present models.

The adoption of steel quotas for all grades of steel following the end of the coal and steel strikes is now a reasonable certainty. Even items like cold-finished bars that were in easy supply prior to the strike will probably start out on quotas to protect established steel consumers against the anticipated rush for steel after the strike is over. This may mean that steel customers without a prewar purchasing record may have a hard time trying to get necessary steel supplies. It could mean a temporary revival of steel conversion and another round of activity by self-appointed steel brokers and "finding" agents. Another possible result may be a scramble for scrap that is today piled high in Detroit scrap yards. Some sources have estimated that 500,000 tons of scrap have accumulated in Detroit.

Ford to Discontinue All Assembly Operations Nov. 15

Most of the predictions here about the resumption of automobile production following the end of the steel strike are on the gloomy side. To an outside observer, Ford, with its own steel plant, would appear to be in the most advantageous position to resume assemblies. Yet Ford now estimates that at least 6 weeks will elapse before full production can be resumed after a shutdown.

At the present time Ford is co-operating with its suppliers who have called on the company "on an emergency basis" for steel. This will be continued, Ford officials say. However, Ford has indicated that its manufacturing operations will be discontinued Nov. 11 and all final assembly operations will come to an end Nov. 15. About 100,000 Ford workers will be affected by the shutdown which will bring to a halt all operations at the Rouge except the production of service parts which will be con-



DAY-AFTER TOMORROW STYLING: Regional winners in the latest competition sponsored by Fisher Body Craftsman's Guild were recently given an opportunity to inspect advanced car models built by craftsmen in GM's famed styling section. Cars like this may never be built but they give an interesting insight into some of the ideas automotive stylists are thinking about nowadays. The bumper design in this particular model should be of particular interest to steel suppliers.

tinued using steel supplied by Ford's own mill.

Will Operate Steel Mill

As a further effort to conserve available materials, Ford has arranged for an additional supply of industrial gas which is being used in place of gas normally supplied by the company's coke ovens. The coke oven cycle time has been increased from 16 to 32 hr, thereby conserving a considerable quantity of coal.

Ford intends to operate its steel mill at capacity to help build up inventories that will be required before car assemblies can be resumed. The company produces about 50 pct of its total steel requirements. Even so it is now believed that a lack of steel inventory balance will prevent resumption of operations for more than a month following the end of the coal and steel strikes.

Meanwhile, GM has announced that beginning the week of Oct. 31 some of its plants will have to reduce operations to 4 days a week. Chrysler plans to curtail all of its operations except Plymouth on Nov. 1. Packard is already operating on a reduced schedule but hopes to continue operations into

November. Hudson has announced that it plans to continue operations until mid-November, Kaiser-Frazer is already closed down for an indefinite period but not from lack of steel, the company has announced.

Sheet Shortage Hits Industry

Detroit—Dwindling steel supplies have forced some auto manufacturers to weld narrower sheets together in order to obtain enough wide sheets for auto tops and hoods.

This practice was widely used during the period of steel scarcity following the war. However, in recent months and with steel in better availability, many companies have discontinued the practice.

With the anticipated shortage of wide sheets after the steel strike is ended, it is expected this expedient will have to be continued for some time following the resumption of auto production.

Opens \$30 Million Addition

Detroit—Officials of local and state governments joined with executives of the Detroit Edison Co. in opening the new \$30 million addition to the Detroit Edison powerplant in Trenton, Mich., on Oct. 25.

The installation is the first 100,000 kw turbo-generator to be installed at the Trenton plant. A similar unit to be added early next year will bring the capacity of the Trenton Channel plant to 500,000 kw.

GM Booklet Proves Popular

Detroit—General Motors has just made its eighth printing of a booklet, "We Drivers" of which more than 10 million copies have already been distributed. The book contains useful driving information based on material drawn from General Motors technical staff.

Subjects covered include "Curves and Turns," "Night Driving," "Our Brakes," "Driving on Hills," "Parking" and other subjects of interest to motorists.

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ARMCO STEEL CORPORATION

WEST COAST PROGRESS REPORT

Effects of steel strike dominate trade thinking . . . Strike of sand and gravel pit workers in L. A. eases steel demand.

San Francisco—As the cub reporter who had been sent to cover high school graduation exercises said to his city editor on returning to the office: "There isn't any story, the high school burned down." This is pretty much the situation on the West Coast so far as the steel industry is concerned.

Any coverage of the metal producing and working industries inevitably leads to a discussion of how long the strike will last; pension programs; state of inventories; and how those western producers still operating are faring.

Western producers who have so little to say about the final outcome of negotiations are pessimistic and the consensus seems to be that President Truman will intercede to bring about a settlement in spite of his statements to the contrary last week.

Warehouse Stocks Decline

At a Pacific Coast management conference held last week in Berkeley, attended by business executives from all points of the country and representatives of industry in general, a cautious note in regard to company pension plans was expressed quite generally. It was pointed out that considerable care would have to be



Digest of Far West Industrial Activity



by

exercised in the writing of benefits to avoid their being too extravagant in ratio to contributions.

Operating at Capacity

Naturally warehouse stocks continue to dwindle with sheets of all kinds practically unavailable and with some metalworking plants beginning to see a termination of operations within a week or two. Thus far, however, western industry continues to move along at a much better pace than might reasonably be expected. As reported before, inventories in both warehouses and metalworking plants were high at the time of the start of the strike.

With one exception the five independent producers in the West continue to operate at capacity with more business coming in than they have had on their books for the last 5 or 6 months. The exception is Northwest Steel Rolling Mills at Seattle which is working only 4 days a week, only because of a lack of business. While fabricating and reinforcing bar mills are loaded to capacity there is not enough demand for straight bar stock to warrant more than this 4-day schedule. The furnaces are working around the clock as usual. This plant is almost always limited by its ingot capacity.

There is a feeling at Northwest that if the strike continues for another month or so more business will come their way although there are limiting factors even to this optimism. As structurals become increasingly scarce, a considerable portion of the construction work involving bars will probably be terminated. Another leveling influence in the market area served by Northwest is the approach of winter which means cold weather, unfavorable to the pouring of concrete and hence a decreased use of reinforcing bars.

Will Shutdown for Repairs

A situation at Northwest provides an example of how labor sometimes acts to its own detriment. While employees of this company were on strike last summer, company officials tried to get the CIO's permission to have AFL labor come in and repair the furnaces so that they would be in good condition when the strike ended. This permission was refused and the work wasn't done with the result that the furnaces

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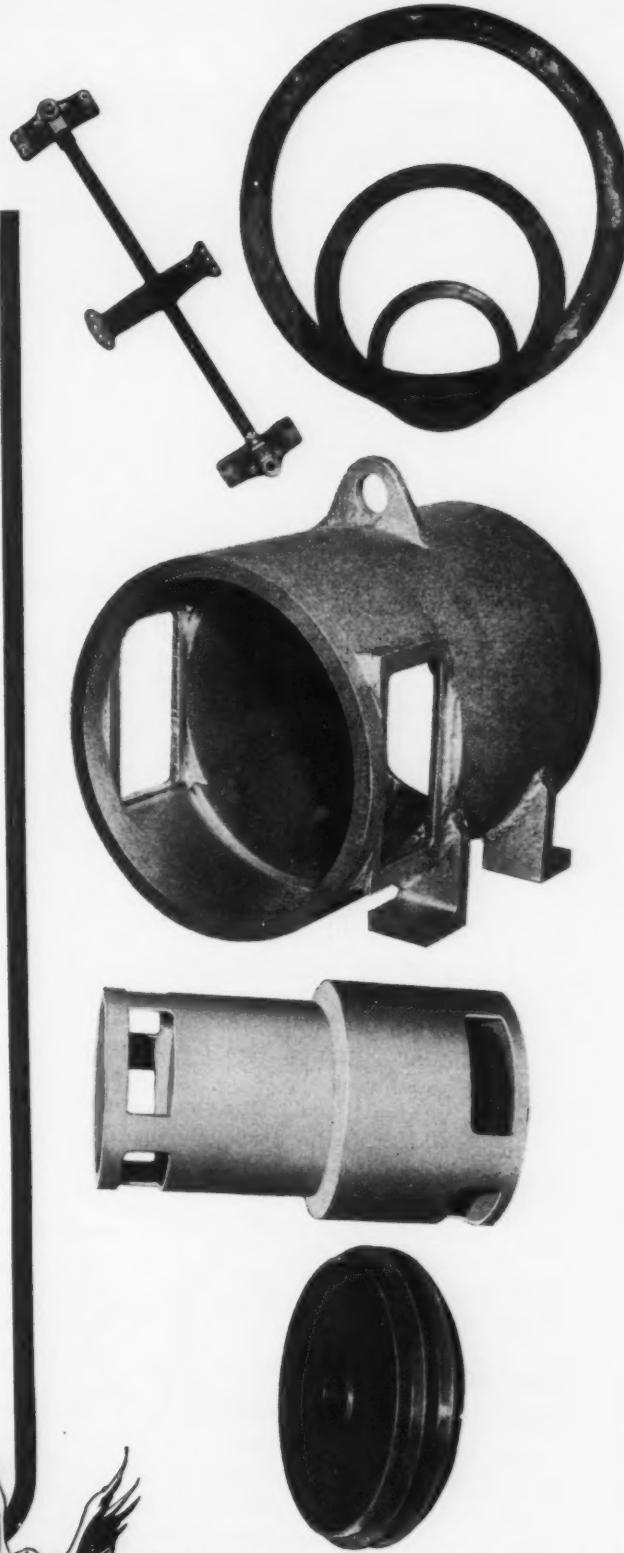
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BIRDS' PARADISE: This specially designed aviary in Seattle's Woodland Park Zoo will be the home of numerous varieties of exotic tropical birds. The climate of each cage is adjustable to the requirements of the individual species. More than 2 miles of Rayduct, Bethlehem Pacific's steel pipe for radiant heating, will help maintain an even temperature for the birds' comfort during the chilly weather.

will have to be shutdown soon for a 1 or 2-week period around the end of this month for repairs. Since ingot supply is barely able to keep up with the capacity of the rolling mill, this will probably mean a layoff for both furnace and rolling crews. This is the second time in a 2-year period that a similar situation has occurred at Northwest.

Pacific States Steel, Judson, Oregon Steel and Kaiser Steel continue to report operations at rated capacity or better. It is estimated that operations will continue in the West for the next week at approximately 24 pct of rated capacity.

Sand Gravel Pit Workers Strike; Plant Shutdowns Loom

Los Angeles—Southern California, which weathered the initial effects of the steel strike with less serious consequences than most areas, today was learning first hand the economic pinch of walkouts.

Originally, only the mills of Columbia and Bethlehem and the smaller Republic plant were struck here. Later this month, Consolidated-Western and Boyle Products were closed down. Supplies were sufficient, however, for

auto assembly plants and for building fabricators to continue at full pace.

The first real setback came with the strike of several hundred sand and gravel pit workers. This strike, which might appear minor at first glance, has brought building and construction to an almost complete standstill, curtailing steel demands in this field and putting 40,000 men out of work. Only 6000 steelworkers have been affected directly by the steel strike.

Plant Shutdowns Expected

In the offing are probable shutdowns of auto assembly plants, and a union election for the San Pedro shipyard of Bethlehem Steel Co.

General Motors is scheduled to drop its combined Buick, Pontiac and Oldsmobile production at its South Gate plant to a 4-day week on Oct. 31, with a shutdown likely later in November. As usual, the Chevrolet plant here has not commented but a similar situation is expected. The Ford plant and the Lincoln-Mercury plant are expected to close between Nov. 11 and 15 along with the Michigan factories. No announcement has been made here by Studebaker, Nash, Chrysler or Willys but their

shutdown is believed imminent. All of these will involve 10,000 more men.

At the Bethlehem San Pedro shipyard, the Metal Trades Council of Southern California, AFL, petitioned the National Labor Relations Board for the election while the industrial union of Marine and Shipbuilding Workers of America, Local No. 9, CIO, is the intervenor in the case. Both claim to represent the employees.

The NLRB will word the election to give employes a choice of CIO, AFL or neither.

The strike which paralyzed the building industry came on the heels of renewed construction activity in September which was rated as the best month in a year. Permits in Los Angeles County totaled \$65,454,199.

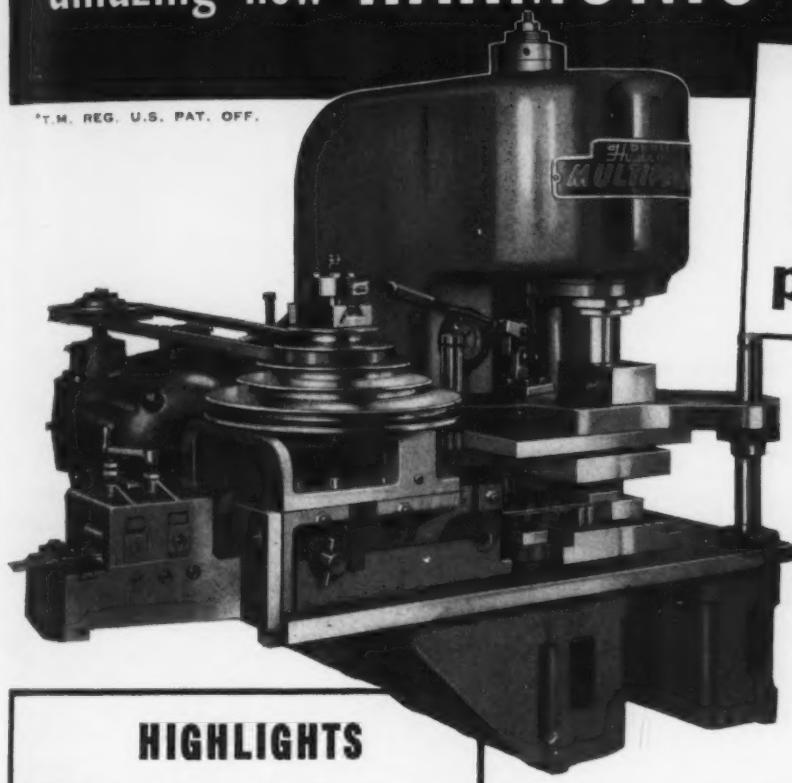
Organizes New Company

Seattle—Construction of heavy duty cranes, marine elevators and material handling equipment which has been the backbone of Colby Steel & Engineering Co., will now be undertaken by a newly organized company known as Colby Steel & Mfg., Inc. The former company will continue in existence but will be devoted to other interests.

M. S. Alexander, who had been vice-president of the original company for the past 25 years, becomes president of the new firm; A. L. Senn, Sr., associated with the original company for more than 30 years as supervising engineer, becomes vice-president and general manager in the new organization. Charles D. Gould who was chief engineer in the old company, becomes vice-president and chief engineer in the new group. Fred Wubbena, who had been assistant treasurer of the original company for 18 years, becomes treasurer.

Mark R. Colby remains as president of Colby Steel & Engineering Co. which in its time has built double-cantilever cranes for heavy dam construction in Washington, California and Tennessee and during the war built special cranes for shipyards throughout the West.

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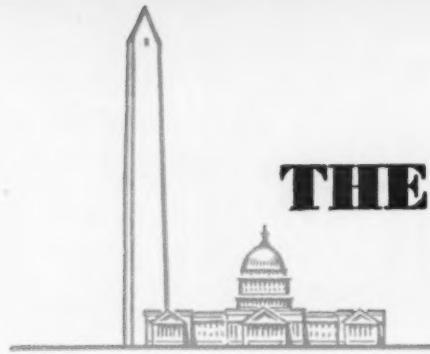
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THE FEDERAL VIEW

THIS WEEK IN WASHINGTON

Senate failure to act on freight absorption does not mean bill is dead . . . FTC may settle with steel on delivered prices . . . More shipbuilding aid asked.

by

Eugene J. Hardy



Washington — Failure of the Senate to enact the compromise legislation designed to legalize freight absorption and delivered price systems does not mean that Congress has given up. In fact, the exact opposite is true. The Senate did not refuse to approve the measure but, in the closing hours of the session, merely put off further consideration until Jan. 20, 1950. Thus far, there has been no actual vote on the bill itself, but merely a number of parliamentary actions which have the effect of making it possible for the Senate quickly to approve the House-passed measure next January and send it directly to the White House. Most observers feel that this is what will take place.

FTC May Settle With Steel

Meanwhile, the possibility of a negotiated settlement in the Federal Trade Commission's delivered pricing charges against the steel industry looms even brighter. Such a settlement, as indicated on this page, 2 weeks ago, would mean the end of the basing point system. Its clear-cut language would dispel a lot of the confusion that has surrounded the legality of delivered

prices ever since the Cement decision emanated from the Supreme Court. It would translate into action the Federal Trade Commission's position that freight absorption as such as not illegal, but would require the steel industry to establish a plant price at every mill and sell f.o.b. mill when requested. Such a negotiated settlement could well resolve the whole delivered price issue, thereby eliminating the need for Congressional action.

Indication that such a settlement might be imminent can be gleaned from the fact that early this week industry attorneys would not comment on the possibility of such a settlement. It is reported that this is because legalistic details are being worked out and advance public knowledge might upset the applecart. Adjournment of Congress appears only to have speeded up these negotiations.

Should a negotiated settlement fail, the possibility for favorable Congressional action on this knotty problem next January is far from gloomy. This is borne out by the fact that, despite substantial opposition from left-wing Senators, not one of them raised a point of order against the bill, thus spelling sure

death for the measure. A point of order against the measure could have been made during the closing days of the session on the ground that the Senate-House conferees added new language—a procedure frowned upon by Senate and House rules.

Issue Hangs on One Word

Perhaps the most important objection raised in the Senate against the conference measure was over the use of one word. Amendments offered by Sen. Kefauver, Dem., Tenn., and Rep. Carroll, D., Col., declare the practice of freight absorption illegal if its effect "may" be to substantially lessen competition. The conferees changed "may" to "will," thus placing a greater burden of proof on the Federal Trade Commission. Legislators objecting to this change claim that it would emasculate the Robinson-Patman price discrimination law. They have stirred up the retail interests to oppose the bill, notwithstanding the fact that there is no basis for such a claim, according to FTC officials.

While there is substantial opposition to the measure in the Senate, led by such sterling statesmen as



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wide demand wherever the finest lubrication is needed. They have high stability over a wide range of speeds, loads, and temperatures. You can count on Sunvis Oils for top performance and the surest protection of your machines. For full information call your nearest Sun Office.

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Democratic Senators Douglas, Ill., Kefauver, Tenn., Long, La., and Humphrey, Minn., there is considerable doubt concerning the sincerity of their objections, since none of them made a move to kill the measure outright, but were content to delay final consideration.

Labor Dept. Abstracts Some Sample Union Contract Clauses

Employee-benefit programs are to play an increasingly important part in future labor agreements.

In effect, industry has played the role of the man who invited his camel into the warmth of his tent. Later he found himself pushed out in the cold.

There is nothing new about pension or other benefit programs. The trouble was that neither type—union-sponsored nor employer-paid—was completely satisfactory. Union programs often ran into financial difficulty, like the current situation of bituminous miners. Free-handed dispensation without provision for sound reserves made for a shaky foundation. Work stoppages

resulted in reduced or stopped payments.

Job Change Is Problem

Nor was the worker happy about losing his coverage when he moved to another job. Also, employees had but little or no voice in administration and quite often had no guarantee that such programs would not be discontinued.

Collective bargaining or what the Labor Dept. calls "contractual" benefit programs got a good foothold during the war. Until that time, there were relatively few such programs established through labor-management contracts.

There were some 15,000 such agreements on file with the Labor Dept. as of July 1948. These covered a minimum of 3,000,000 workers. While the figures are not available, undoubtedly the number of such contracts and coverage has greatly increased within the past year.

The Labor Dept. is lending its moral, if not outright assistance, to promulgation of more such contracts. Its latest effort is the re-

lease of a preliminary draft of a chapter for its revised edition of *Bulletin 686*, under the heading of "Union Agreement Provisions." This is a compendium or handbook of sample clauses from current and outstanding contracts. These are not offered, the department explains, as models for future contracts but "rather a frame of reference to be used by negotiators in free collective bargaining."

U. S. War-Built Merchant Fleet is Becoming Obsolete

A recent report by a Senate Commerce subcommittee warns that the nation's wartime-built shipping fleet is rapidly becoming obsolete. It adds that a program for building new ships may become necessary as a matter of security—and that a repair program for ships now laid up as a reserve is certainly necessary.

The report comes at a time when the Administration is preparing for a drive to increase subsidies for American shipyards which are feeling the pinch of growing foreign competition.

The Maritime Commission is carrying the ball. It believes that devaluation will shortly put an even greater squeeze on American shipyards. Even now it is drafting proposals to be presented next Congress.

The commission has White House backing for its proposal which would throw out the present 50 pct maximum subsidy toward construction costs which is now allowed under the Merchant Marine Act of 1936.

Subsidies May Be Increased

An amendment striking out the present maximum, leaving only the parity provision, would leave the way open for payment of subsidies which some believe might amount to 60 pct or more of construction costs.

Some private builders are opposed to any increase in the present 50 pct on the grounds that any additional contribution would amount to giving the government a controlling interest.

THE BULL OF THE WOODS

By J. R. Williams



HIGHLIGHTS

Of The 33rd Metal Show

THE 31st National Metal Congress and Exposition, held in Cleveland last week, was a tribute to the greatness and ingenuity of American industry. Not even the sourest cynic could have visited this show without being deeply impressed by the machinery and equipment, the processes and products here on display. Never before has there been so much convincing evidence at one place and at one time—evidence of the fruitfulness of the united efforts of science and industry.

Cleveland's huge public auditorium was none too large to handle this record-breaking tribute to the metalworking industry. There were about

400 exhibits, which were viewed by nearly 100,000 persons. These interested persons came to see the products of American industry; they were not lured in by stage shows or door prizes.

Economy in Production was an especially appropriate and timely theme for this great show. It was seized on most effectively by many of the exhibitors as a means of getting their messages to the public. As one top executive publicly commented, "That's a subject I really understand."

To industry, economy in production means competitive advantage. It means making a profit, paying dividends and expanding, or, simply staying in business. This catching and hard-



A. E. Focke
ASM president



O. B. J. Fraser
AWS president



F. N. Rhines
IMD chairman, AIME



L. W. Ball
SNT president



Metal Show Highlights

Continued

hitting phrase embodies the secret of America's industrial genius and might.

To the average American, economy in production means more goods for less money. It means shorter and more pleasant working hours, higher pay and an increasingly bountiful standard of living. It means that yesterday's expensive luxuries are today becoming commonplace to the man on the street.

This is the real voice of America. It tells the story more effectively than the most eloquent speaker or the most facile writer. It gives meaning to the physical side of man's search for progress.

A feature of the ASM phase of the show was the annual banquet, at which the principal speaker was Charles Cox, dynamic president of Carnegie-Illinois Steel Corp. Step by step, he outlined a century of progress in the steel industry. The cumulative effect of this progress was to provide more goods of better quality at cheaper prices.

Turning to the future, Mr. Cox spoke of "a great problem facing the steel industry today. The time is passing when high grade ore and low ash coal can be shipped direct from the mines ready for the furnaces or the coke ovens."

Mr. Cox sees the ore problem being solved by a combination of imported ore from Labrador and South America and the recovery of usable iron from the vast supplies of domestic taconite rock.

In all American history, he said, we have dug less than 5 pct of the known bituminous coal reserves. But, unfortunately, this 5 pct represented much of the best low sulfur, low ash coking coals so well adapted to the blast furnace.

"Today, the sulfur problem is exacting from research and engineering their utmost ingenuity."

He lauded work now being done with pressure top blast furnaces and oxygen enrichment of the blast. "Today, our technical people are turning their attention to the development of a rapid process which will combine the most desirable features of the openhearth and the bessemer, and which will require no external fuel."

He expressed confidence that our newest problems would be solved. But to do this, he charged, we must have science, mechanical appliances, and contended labor working closely together.

The technical phase of the show also reflected the overall theme and the great diversity in subject matter embraced by the four participating societies left little to be desired.

In addition to the formal technical presentations, round-table discussions and educational programs, three of the societies sponsored award lectures: E. H. Dix, Jr., Aluminum Co. of America, delivered the ASM Edward De Mille Campbell Memorial lecture; W. M. Wilson, professor of structural engineering, University of Illinois, presented the AWS Adams lecture; and L. A. Danse, General Motors Corp., delivered the SNT Lester lecture.

These three groups also held elections of officers during the show, with Arthur E. Focke, research metallurgist, Diamond Chain Co., the new ASM president; O. B. J. Fraser, International Nickel Co., the new AWS president; and Leslie W. Ball, Naval Ordnance Laboratory, the new SNT president. The Institute of Metals Div., AIME, holds no election during metal show week; F. N. Rhines, professor of metallurgy, Carnegie Institute of Technology, is chairman.

Highlights of the show are presented pictorially in the following pages, touching upon the activities of all four societies.

Speaker's table at the annual dinner of ASM.





Presentation of the ASM president's medal to Francis B. Foley, Midvale Co., Philadelphia.



Fred H. Haggerson, president, Union Carbide and Carbon Corp., New York, recipient of the ASM medal for the advancement of research.



The ASM Sauveur achievement award was presented to Marcus Grossman, director of research, Carnegie-Illinois Steel Corp., Pittsburgh.



Edgar C. Bain, vice-president, Carnegie-Illinois Steel Corp., Pittsburgh, received the ASM gold medal.



Principal speaker at the ASM annual dinner was Charles R. Cox, president, Carnegie-Illinois Steel Corp., Pittsburgh.



Presentation of the ASM Henry Marion Howe medal to B. L. Averbach, MIT. Co-recipients of the award were Morris Cohen and G. S. Fletcher, also of MIT.

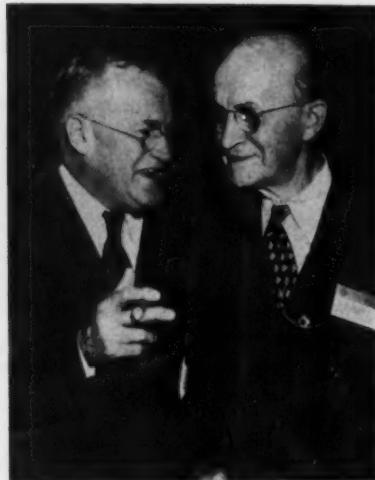


Metal Show Highlights

Continued



W. M. Wilson, Professor of Engineering, University of Illinois (right), delivered the AWS Adams Lecture, on the subject "Advantages and Disadvantages of Electric Welding." Shown with Professor Wilson is G. N. Sieger, president of S.M.S. Corp., Detroit, and outgoing president of AWS.



Dr. C. A. Adams, (right) director of AWS and pioneer of welding, attended the president's reception held Tuesday evening. He is shown here in the company of A. H. Davis, Lincoln Electric Co.



O. B. J. Fraser, International Nickel Co., New York, and newly elected AWS president, is shown with G. N. Sieger, outgoing president.



In the photo at lower right are shown J. Heuschkel (left) and H. Bitzer (center) receiving the Resistance Welders Manufacturers Assn. first prize, from B. L. Wise, president of RWMA . . . Left is shown I. W. Johnson, General Electric Co., winner of second prize, and . . . At lower left is F. G. Harkins, Solar Aircraft Co., winner of third prize. AWS.





Newly elected ASM president A. E. Focke, research metallurgist, Diamond Chain Co., Indianapolis (left), and outgoing president H. K. Work, director of research, College of Engineering, New York University.



Kent Van Horn, Aluminum Co. of America (left), and E. H. Dix, Jr., assistant director of research, Aluminum Co. of America, the ASM Edward de Mille Campbell Memorial lecturer.



William H. Eisenman, ASM secretary.



R. W. Wilson (left), chief metallurgical engineer, Timken Steel and Tube Div., new ASM treasurer; W. E. Jominy (center), staff engineer, Chrysler Corp., Detroit, new vice-president; and E. Gammeter, chief metallurgist, Globe Steel and Tube Co., Milwaukee, a newly elected trustee. Also elected as trustee was J. G. Digges, metallurgist, National Bureau of Standards, Washington.

Metal Show Highlights

Continued



Maxwell Gensamer, assistant director of research, Carnegie-Illinois Steel Corp., senior vice chairman of IMD, AIME (left), and A. A. Smith, Jr., general superintendent, American Smelting & Refining Co., past chairman.



The AWS Samuel Wylie Miller Memorial Medal was awarded to A. G. Bissel (right), principal engineer, Bureau of Ships, Navy Department, Washington, D. C., for his contributions to the advancement of welding and cutting of metals. Presenting the award to Mr. Bissel is Rear Adm. Ellis Reed-Hill, U. S. Coast Guard.



F. N. Rhines, Prof. of Metallurgy, Carnegie Institute of Technology, Pittsburgh, and chairman IMD, AIME, is shown with C. D. King, U. S. Steel Corp. of Delaware, chairman of Iron and Steel Div. (left) and J. D. Sullivan, Battelle Memorial Institute, chairman of the extractive metallurgy division (right).

Typical exhibits at the National Metal Exposition.



R. M. Brick, University of Pennsylvania, vice chairman of IMD (right) and A. B. Kinzel, Union Carbide & Carbon Research Labs, AIME vice president and director (center) are welcomed to the IMD annual dinner by E. Kirkendall, secretary.





Newly elected SNT president L. W. Ball, Naval Ordnance Laboratory (left) and D. W. Smith, chief research metallurgist, Permanente Metals Corp., Spokane, outgoing president.



L. A. Danse, General Motors Corp. (right), delivered the SNT Lester Lecture, on the subject "Magnetic Inspection Methods." He was introduced to the audience by W. E. Thomas, new vice-president.



P. D. Johnson, SNT secretary (left) W. E. Thomas, Magnaflux Corp., Chicago, newly elected vice-president (center), and N. A. Kahn, head metallurgist, N. Y. Naval Shipyard, Brooklyn, the new treasurer.



Cleaning and Phosphating Tractor Parts

In One Operation

By L. WILLIAMS



Superintendent, Tractor Plant,
Harry Ferguson, Inc., Detroit

EXPERIENCE has demonstrated that success of painting applications on farm tractor parts depends largely on the pretreatment of the metal surface. By the adoption of a new technique, normal part cleaning plus a phosphate coating protection are possible in the same length of time formerly required for cleaning. Operating experience has justified the decision to use this one step cleaning and phosphating method in preference to a two stage operation that would have been required to provide the same protection if the formerly used emulsion cleaner had been continued. Further advantages accrued from the fact that existing equipment was utilized with only slight modifications to adapt it to the new method.

With respect to the painted surfaces of tractors, such surfaces may be exposed continuously to a combination of severe service conditions including weather, acid soils and the corrosive action of insecticide sprays and fertilizers. There is also the constant exposure to flying stones as well as erosion resulting from dust.

Realizing that such conditions expose any weakness in the finish of painted tractor parts, particular emphasis was placed on proper preparation and pretreating of components to get better paint finishes and at the same time some protection in case of actual damage to the painted surfaces. The method selected, using

Detrex 79, a non-alkaline cleaner and phosphate coating material, involved several vital considerations. The procedure adopted had to be capable of completely and successfully pretreating stampings as well as malleable and gray iron castings. Unit production cost, including labor and materials, had to be kept at a minimum. The operation had to be kept within the existing 240 sq ft of floor space. Reject rates could not exceed 1 pct. And, the process had to be capable of utilizing standard cleaning equipment already on hand with no investment in new equipment.

A total of 63 sq ft of surface area must be cleaned and phosphate coated on each Ferguson tractor. Operating experience showed that with production of 100 tractors per day, the cost of the new method of cleaning and phosphate coating material is approximately \$0.075 per tractor, equivalent to \$.0012 per sq ft. These costs are based on the original charge plus the normal daily additions of material to maintain solution strength. At rated capacity of 500 tractors per day, the cost is slightly lower. Typical charge and replenishing data on the cleaner and phosphate coating compound for a three week period are shown in table I.

The phosphate coating produced provides a rust-protective surface that has a fine matte finish that gives maximum paint adherence. If the paint film is broken, the phosphate coating localizes corrosion to the area of the paint rup-

SUMMARY: In a one-stage operation recently adopted by Harry Ferguson, Inc., Detroit, tractor parts are cleaned and phosphate coated, producing on them not only a good paint base surface but also a protective, corrosion resistant coating for the metal. This article describes the cleaning and coating operations and reviews the costs.

ture. Tests conducted by an automotive company showed a resistance to salt spray of 504 hr for Detrex 79 treated parts.

Tractor parts, such as shown in fig. 1, are hung on a monorail conveyor for transporting through a two-spray zone International Conveyor Co. washer that is charged with Detrex 79. The cycle of operations includes a 2 min wash in Detrex 79 at 180°F. In the wash, the parts are sprayed by a battery of 300 nozzles. The solution is supplied to the nozzles by a 1000 gal per min capacity pump.

The second stage operation is a 2 min rinse at 180°F, the operation duplicating the first stage as to nozzle arrangement and pump capacity. The third stage is a 1½ min steam-heated air dryoff at a steam pressure of 125 psi. A specific advantage in the use of Detrex 79 is the rapid drying characteristics imparted to the treated metal surfaces. Except for blowoff of the lips of a few parts, no additional labor is required for water removal after passing the drying stage.

Fig. 2 shows the parts emerging from the cleaning and phosphate coating treatment. Except for the blowoff, parts pass directly into the prime coat spray booth. There is no hand wiping operation.

The original charge and make-up are based on a three-week period. This is the running time for one charge at the Ferguson plant. At the end of this period, the contents of the washer are dumped, and the washer is flushed out. The cleaning operation requires no pump-

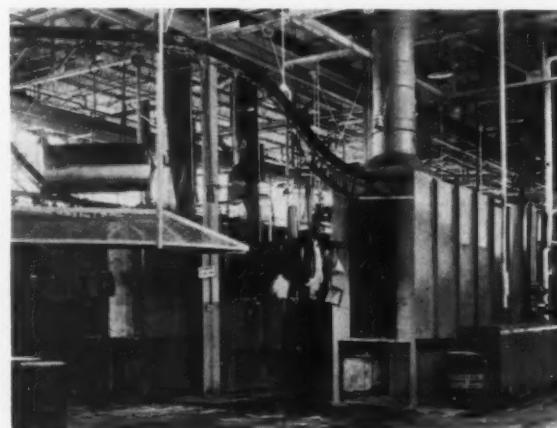


FIG. 1—Typical tractor parts hung on monorail conveyor are delivered to a two-spray zone International washer. The parts receive a 2 min wash at 180°F. The speed of the conveyor ranges between 6 and 18 fpm.

ing of the solution into a settling tank, and there is no chemical caking on the heating coils or the sides of the washer. All pump lines have remained free since this material was adopted. A daily control over the cleaning operation is maintained by simple titration. The workman

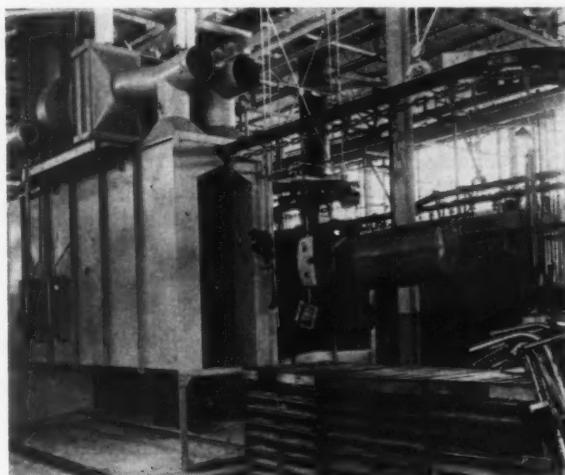


FIG. 2—Parts emerging from the washer immediately after a 1½ min hot air dryoff. Except for a blowoff of the lip of a few parts, all water is removed in this operation.

TABLE I

Typical Three Weeks' Operation of Multistage Washer Charged With Detrex 79, a Cleaner and Phosphate Coating Compound.

Date	Charge	Amount, Lb
4/5.....	New	250
4/7.....	Makeup	25
4/11.....	Makeup	30
4/13.....	Makeup	24
4/14.....	Makeup	12
4/19.....	Makeup	38
4/22.....	Makeup	54
4/25.....	Tank Dumped and Recharged	

in charge of the washer is entrusted with this duty.

Following the cleaning operation, parts are rinsed and dried as described previously. They are then carried on the conveyer through the following sequence of operations: (1) Prime with red oxide primer. This material is sprayed on to provide complete coverage for subsequent enamel coating. (2) Air drying of primer prior to enameling. Time required for this operation is 4 min. No fans are required to increase the rate of air circulation as a flash-type, rapid drying primer is used. (3) Spray gray enamel paint in a water-curtain type of paint spray booth. This operation is shown in fig. 3. The water-curtain picks up the paint overspray, drawn in by high volume fans, thus eliminating fire hazard from the oils and thinner in the paint and making for clean, healthful opera-

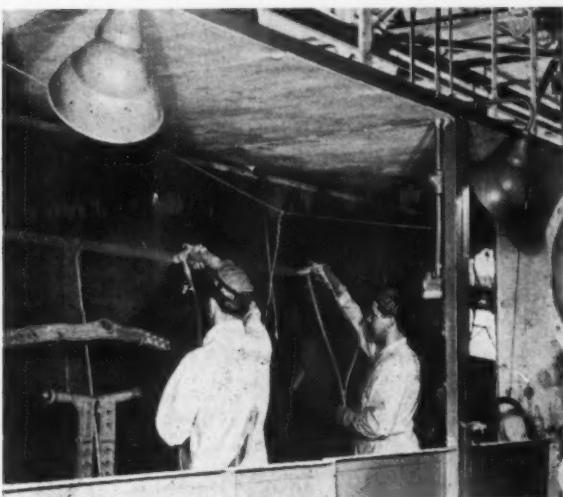


FIG. 3—Painting tractor parts in a Schmieg water-wash spray booth.

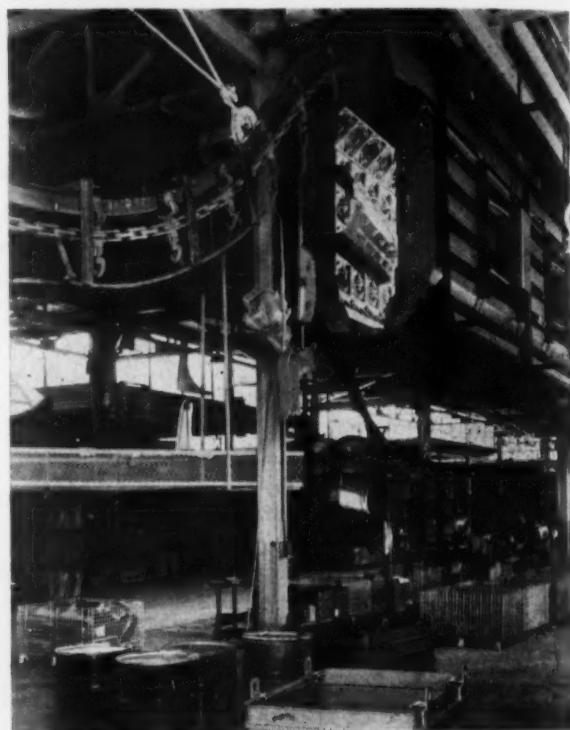


FIG. 4—Parts are carried by a monorail conveyer to a 62 ft Fostoria oven equipped with 1176 infra-red lamps. Drying temperature is 180° to 325°F.

tion. (4) Dry in a 62 ft Fostoria oven, equipped with infra-red lamps. Parts are carried through the drying as shown in fig. 4 by an overhead conveyer. Temperature range is 180° to 325°F, and drying time is 10 min.

Experience shows that the finish on Ferguson tractors is standing up exceptionally well in field service. In fact, no parts have been rejected for poor finish since Detrex 79 was adopted early in 1949.

New Books

"Technology of Light Metals," by A. von Zeerleder. Second English edition of the author's "Technology of Aluminum and Its Light Alloys." The book gives special prominence to the most recent testing and working methods, imparting the entire working practice of light metals for the working practitioner, works engineer, or designer. Elsevier Book Co., Inc., 215 Fourth Ave., New York 3. \$6.00. 380 p.

"Proceedings of Metal Powder Assn. 5th Annual Meeting." Book contains seven papers delivered at the 1949 session by leading powder metallurgists, and metal powder producers. Metal Powder Assn., 420 Lexington Ave., New York 17. \$3.00. 116 p. Proceedings of 2nd annual meeting also available at \$1.00 and 3rd and 4th annual meetings at \$2.50.

"ASTM Specifications for Rolled Structural Steel." A new specification involving general requirements for delivery of plates, shapes and bars, incorporating much of the data common to several individual structural specifications. American Society for Testing Materials, 1916 Race St., Philadelphia 3. \$1.00. 34 p. Reduced prices for quantity orders.

"Refractories." An outstanding compilation, well illustrated in four colors, of information on history, manufacture, use and properties of industrial refractories. Handy engineering tables are included. Illustrations are especially instructive and language is not highly technical. General Refractories Co., 1420 Locust St., Philadelphia 2. 272 p.

Welding Stainless Steel

By LESTER F. SPENCER

Landers, Frary & Clark,
New Britain, Conn.

HERE are four basic types of spot welding machines—the rocker arm spot welder, the press-type spot welder, the portable spot welder, and the multi-electrode type spot welder. They have various methods of operation and cover a wide range in both size and capacity. The rocker-arm type is so-called because welding pressure is applied and the upper electrode is raised for loading or unloading the work. This machine usually is used in welding light gages. The press type is so-called because of the straight line operation of the upper electrode. The portable type is used for massive structures where it is more convenient and economical to move the welder rather than the job. There are many designs of this type of welder, the principle ones being pinch guns, expansion guns, and the bar or lever operated guns. Multiple spot welders can be classified as special machines since they are usually designed for specific jobs. The welds are made in multiple, either vertically or horizontally, depending upon the application. Spacing between the welds must be sufficient to insure passage of the welding current through a lower conductor bar instead of the metals being welded. Usually 1 to 2 in. is a safe minimum¹ for very light gages, whereas a distance of 6 to 8 in. may be necessary on heavier gages. Fig. 6 shows a multiple spot

welding application in the welding of evaporator assemblies.

The table type projection welding machine, shown in fig. 7, is used to lock a weather tight, tamper-proof retaining ring to a glass meter case. A snug fitting metal ring is dropped over the tapered bowl of the glass housing and is securely locked in place by welding to the inner surface of the ring three small metal clips that overlap the lip of the bowl. Provisions are made for holding the work securely and accurately so that pressure can be applied without breaking the glass. The machine is a special, three-headed, table-type, air-operated projection welder. It provides a central loading fixture with three air-operated electrodes bearing radially on the work in a horizontal plane. Each electrode is connected to a separate 30 kva transformer with the central fixture as a common terminal.

Seam welding is a resistance welding process wherein the weld is made lineally between two contact rollers or between a contact roller and a contact bar. A seam weld is a series of overlapped spot welds where the overlapping is controlled by the timing and the speed of the rolls. When the spots are not overlapped enough to produce gas tight welds, the process is often referred to as roller spot welding. The different types of standard seam welding machines include the single purpose longitudinal seam welder, the single purpose circular seam welder, and the combination longitudinal and circular seam welder.

In the longitudinal seam welder, work is fed into the machine throat depths, which varies with the length of the item to be welded. Typical of such welders is one longitudinal seam welder

The first part of this two-part article, dealing with the behavior of various stainless steels when subjected to welding temperatures and describing projection and pulsation welding techniques, appeared in the Oct. 20, 1949, issue of THE IRON AGE.

SUMMARY: Practical suggestions for successfully welding various types of stainless steels by spot, seam roller, arc, submerged melt, inert gas shielded arc, and gas methods are given in this, the concluding part of a two-part article. The economics of the various techniques are also explored by the author.

Welding Stainless

Continued

with a throat capacity of 60 in. That is used for long tubular welding. The welds are started at the extreme edges of the work by a synchronous timer and motor starter. Seam welds as long as 90 in. have been made on this type of equipment. A hand switch and a long cable feed and guide the work without the aid of a helper.

In the circular seam welder, the head welds a cylindrical piece of work with the work either projecting into the machine throat depth or projecting away from the welding wheels. Fig. 8 shows a circular seam welder that has a 35 in. throat and an electrode force of 3500 lb, and is used for welding comparatively heavy stainless steel, 0.125 in. thick.

Synchronous interrupted timing is preferred for most seam welding applications because it controls the heat effect, allows each spot in the seam to cool under pressure during off time, gives less distortion and warpage, and permits better control over surface disturbances. Heat is produced and localized in seam welding the same as in spot welding with the exception that welding wheels are employed to produce the weld. The wheel width in seam welding is a controlling factor in the production of acceptable welds. As material thickness increases, there is a corresponding increase in wheel width, the purpose of which is to avoid excessive unit pressures and unit current densities. Wheels employed in seam welding should have at least a 75 pct conductivity rating and a hardness of RB 76. The net electrode force, the on time cycle, the off time cycle and the welding current increase in value as the thickness of the stock to be welded increases. Conversely, as stock thickness decreases, there is a corresponding decrease in both welding speed and the number of welds per inch. Table IV as compiled by the American Welding Society⁵ will serve as a guide to the various factors involved in seam welding.

In seam welding austenitic steels, it is customary to have a continuous supply of cooling water directed upon the weld immediately after each weld of a seam. Not only will this minimize the precipitated carbides in welding the nonstabilized grades, but there will be less warpage and surface burning and greater wheel life.

In spot welding, distortion and stresses from welding shrinkage are more severe on the austenitic compositions than on mild steel. This also can be true in seam welding. In either case, it is advisable to determine prior to production the overall effect of distortion and shrinkage on the completed item so that these effects can be corrected by changes in design. In either spot or seam welding¹ the extent of weld shrinkage can be reduced by reducing the size of the individual

spots. It is better to have more spots of smaller size than fewer spots of large diameters.

Because there is a relationship between the tensile strength of the material and the percentage of allowable weld shrinkage, experimental procedures are in order in determining the diameter of spots permissible to stay within the shrinkage tolerances. Mallory¹ recommends a safe upper limit of spot weld diameter as four to five times the thickness of the thinnest sheet welded.

The most efficient method of determining the quality of either a spot or seam weld is by preparing a section for metallographic inspection and examining the characteristics of the weld nugget. Macroetching cross sections is also a standard procedure in determining gross-defects within the weld nugget. Fig. 9 shows the results of a comprehensive study of a metallurgical specimen taken from a seam weld. This examination resulted in a change of practice to eliminate voids, even though the weld proved satisfactory in service. Stainless steel, 0.025 in. thick, was seam welded at 50 amp, 550 volts and at a speed of 60 ipm. Water coolant was used directly after seam welding.

While the weld was satisfactory with no carbide precipitation in evidence, there is in evidence

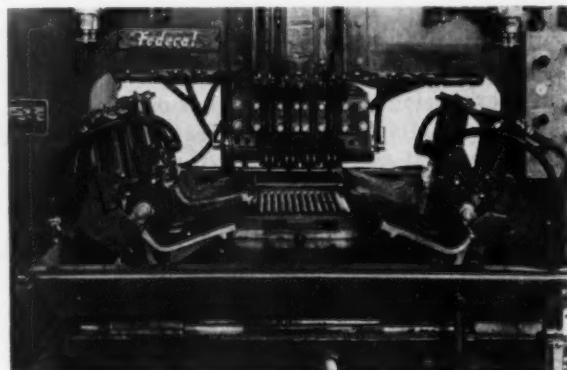


FIG. 6—Evaporator assemblies are welded with this four-headed roll-spot welding machine. Two thicknesses of 302 stainless are used with spots at $\frac{1}{4}$ in. centers and welding is done at speeds of 20 to 25 fpm. Photo courtesy Federal Machine & Welder Co.

an included oxide condition, shown in panel *c*, and an air gap in the center of the weld, shown in panel *b*. The oxide, probably Cr_2O_3 is the result of an oxidation during welding. The weld zone is rather broad, approximately 0.085 in. long and 0.0170 in. wide. The heat affected zone is small in comparison to the weld area. The photomacrographs shown in fig. 9 were etched electrolytically in 10 pct oxalic acid.

Austenitic stainless steels can be arc welded quite readily. Although welding is generally done with direct current using reversed polarity, at times and particularly with heavy sections, straight polarity is employed. Because of the poor heat conductivity of these alloys, very little

heat is dissipated to the metal adjacent to the weld and for this reason good penetrations and less distortion are obtained with reversed polarity. Considerable control is necessary in welding these analyses, not only in the selection of the proper electrode, but in the preparation of the base metal. To minimize the introduction of foreign carbon, the area to be welded must be free of all matter that may prove a source of carbon contamination.

Arc welding is usually reserved for welding medium to heavy gages. The heavier the gage, the greater the need for the selection of a stabilized grade. This is because heat retention is too long in heavy sections, causing a massive intergranular carbide structure that may or may not be removable by heat treatment, depending upon

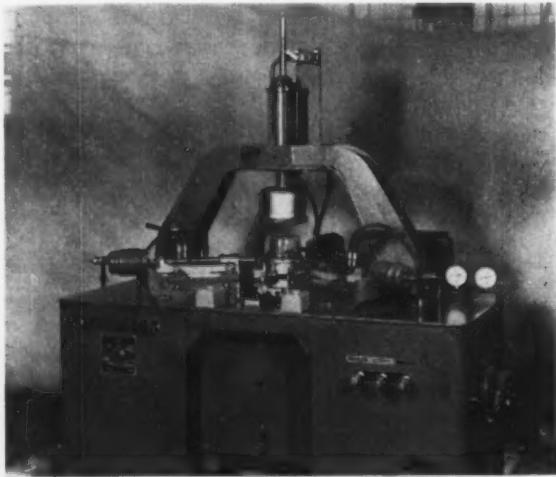


FIG. 7—A special table type projection welder is used to mount a metal sealing ring on a glass meter bowl. Three air-operated electrodes bear radially on the work and each electrode is connected to a separate 30 kva transformer with a central fixture as a common terminal. Photo courtesy Thomson Electric Welder Co.

the size of the welded structure. The choice of composition will also depend upon the degree of corrosive action that will take place during service. If mild corrosive conditions are expected, unstabilized stainless may be welded.

In the matter of joints, the butt weld joint is the preferred from the standpoint of complete penetration. This joint can be used for light to medium thicknesses, with a gap of about one-half the thickness of the material to be welded. On heavier gages, single V, double V, single U, and double U joints are employed. As the gage of the material increases, multiple pass welding becomes necessary. After each pass, scale formation should be thoroughly removed so as not to contaminate the joint and cause mechanical weakening or loss of corrosion resistance. In many cases, the proper electrode will permit easier removal of this scale, an important feature where surfaces are to be highly polished and tool marks cannot be tolerated.

In welding light gage stock, the best procedure to minimize distortion is to clamp the work, holding it in alignment. The use of fixtures is quite common, especially in straight line welding or in the welding of curved sections. Copper chill bars, commonly known as backing plates, minimize intergranular carbides. The chill bar has a narrow shallow groove, and is placed under the work so the groove is directly behind the weld joint. On top of the section to be welded are two hold-down bars made of steel and faced with copper, their positions being such that the copper facing is toward the work. These hold-down bars are beveled so that the weld can be easily placed in the joint. The groove in the backing chill bar serves as a mold, holding the weld in shape and facilitating subsequent grinding. Good heat conductivity of the chill bar will assure rapid cooling of the weldment.

Electrode analysis should be similar to the analysis of the metal being welded. Because of the tendency toward volatilization of such elements as chromium, molybdenum, titanium and columbium during welding, coated electrodes are preferred. The coatings serve both as a fluxing agent and a protecting agent against undue oxidation. To compensate for alloy losses during metallic arc welding, the electrode, the coating, or both may contain an excess of those elements that tend to volatilize, assuring that the weld metal will be within the specified limits of the base analysis.

In welding stabilized analyses, the electrodes employed are also of the stabilized composition, the stabilizing agent being columbium, usually to an extent of from 0.50 to 0.80 pct depending upon the analysis to be welded. Columbium can be readily transferred from the electrode to the weld. This cannot be done with titanium, this element being a total loss in arc welding. The loss of columbium is quite high, volatilization losses ranging as high as 30 pct and any loss must be compensated for in the electrode or the coating. An interesting comparison of the relative values of both columbium and titanium stabilizing compositions was made by Hafsten⁴.

Lime covered electrodes used on reversed polarity are the most acceptable electrodes, having the favorable characteristic of less cracking in joints that are highly stressed or in welding material of high hardenability. One of the greatest difficulties encountered in the use of lime covered electrodes is the difficulty of slag removal in confined joints and small fillets. This may be particularly disadvantageous on surfaces to be highly polished where tool marks cannot be tolerated.

Recently developed was a new type of electrode coating formulated to operate either with ac or dc. It is claimed that these electrodes produce a better appearing deposit, are more uniform in action during welding, and are easier to handle than lime coated electrodes. The exact coating composition of these electrodes is not known by

Welding Stainless

Continued

the author, but they contain lime as a basic coating with additions to perform the claims. Both the newly developed electrodes and the standard lime coated electrodes are made in stabilized grades.

Coated electrodes should be stored in specially designed rooms where temperature is kept between 80° and 90°F and humidity is controlled to prevent absorption of moisture by the coating. Damp electrodes are a common source of trouble and, in addition, the coating may actually drop off during welding.

In welding martensitic stainless compositions, the same general rules apply as in welding the austenitic grades. When proper preheating equipment is available and annealing is planned, a filler metal of approximately the same analysis as the base metal is recommended. When conditions are such that annealing is not practical, the austenitic filler electrode analysis is recommended to obtain greater ductility in the weld. Preheating straight martensitic chromium steels to 350° to 400°F is necessary prior to welding. Immediately after welding, an annealing operation is usually conducted to reduce brittleness.

Wide variations in current and arc length should be avoided, and beads deposited should be small. The low electrical conductivity of the straight chromium steels makes the use of high welding currents objectionable. The direct current electrodes give highly satisfactory results, and high quality welds can be produced in all positions. Porosity is difficult to eliminate completely in any but the downhand position. This, however, is also true in welding austenitic steels.

Welding ferritic stainless compositions is difficult because of the inevitable grain growth within the weld area. The resultant embrittle-

ment is further enhanced because there is no corrective heat treatment possible. Ferritic alloys are not recommended for welded structures unless they will be used in applications involving high temperature service.

Mechanical properties of stainless steel weld deposits are affected by such factors as welding current, pass thickness and arc length, the reduction in values being considerably more than experienced in welding carbon steels. The mechanical property most affected is elongation, this being reduced as much as 50 pct by the use of either too low a current or too heavy a deposit.

Automatic welding or submerged melt welding is a form of arc welding generally employed in high production work. The equipment used in the application of the process⁵ consists of a welding heat that contains a mechanism for feeding electrode wire to the joint and a means of applying the granulated fluxing material along the joint and around the end of the electrode. The function of the flux is to furnish protection from the atmosphere during welding and cooling. Melting of the electrode takes place under the flux layer and no arcing is visible. That portion of the flux not used to form the hard glassy crust on top of the welding bead can be recovered for reuse.

This method is ideal for straight line or circumferential welding of deep grooves in heavy plates in a single pass, and in other types of work of a repetitive character. Welding current, speed of travel, and electrode feed are all subject to close adjustment and automatic control. Anderson and Roberts⁶ reported the use of submerged melt welding in welding $\frac{3}{4}$ in. thick columbium bearing 18-8. In welding this material, a 45° joint, a welding speed of 12.5 ipm and a current of 900 amp at 40 volts were employed. Tensile strength tests of the joint showed a 40,000 psi yield and an ultimate strength of 76,450 psi. Corrosion tests indicated that the weld corrosion rate was essentially the same as the base composition.

Oxyacetylene welding has been used quite successfully in welding stainless steel, but success can only be realized by the observance of the characteristics of stainless, the precautions in cleanliness of the weld area prior to welding, and good joint design. The source of heat is from the combination of oxygen and acetylene. This heat source melts the electrode material to form the bead, the speed of travel being dependent upon the operator who sets his pace in accordance to the specific welding job.

Flame adjustment is important, the recommended flame being neutral. A flame that is strongly oxidizing⁷ causes porous welds, while a flame that is strongly reducing will modify the corrosion resistance and decrease the ductility of the weld joint. Because of the inherent characteristics of stainless steels, a welding tip is recommended that is about one or two sizes smaller than that used in welding mild steel. The angle at which the blowpipe flame is held should be

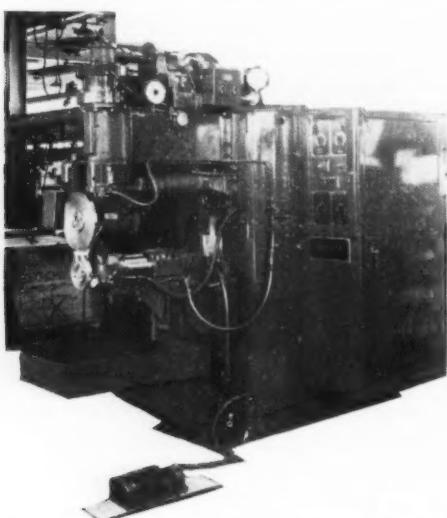


FIG. 8—For seam welding stainless up to $\frac{1}{8}$ in. thick, this 125 kva, three phase unit is employed. It has a 35 in. throat depth and 3500 lb electrode force. Photo courtesy Sciaky Bros., Inc.

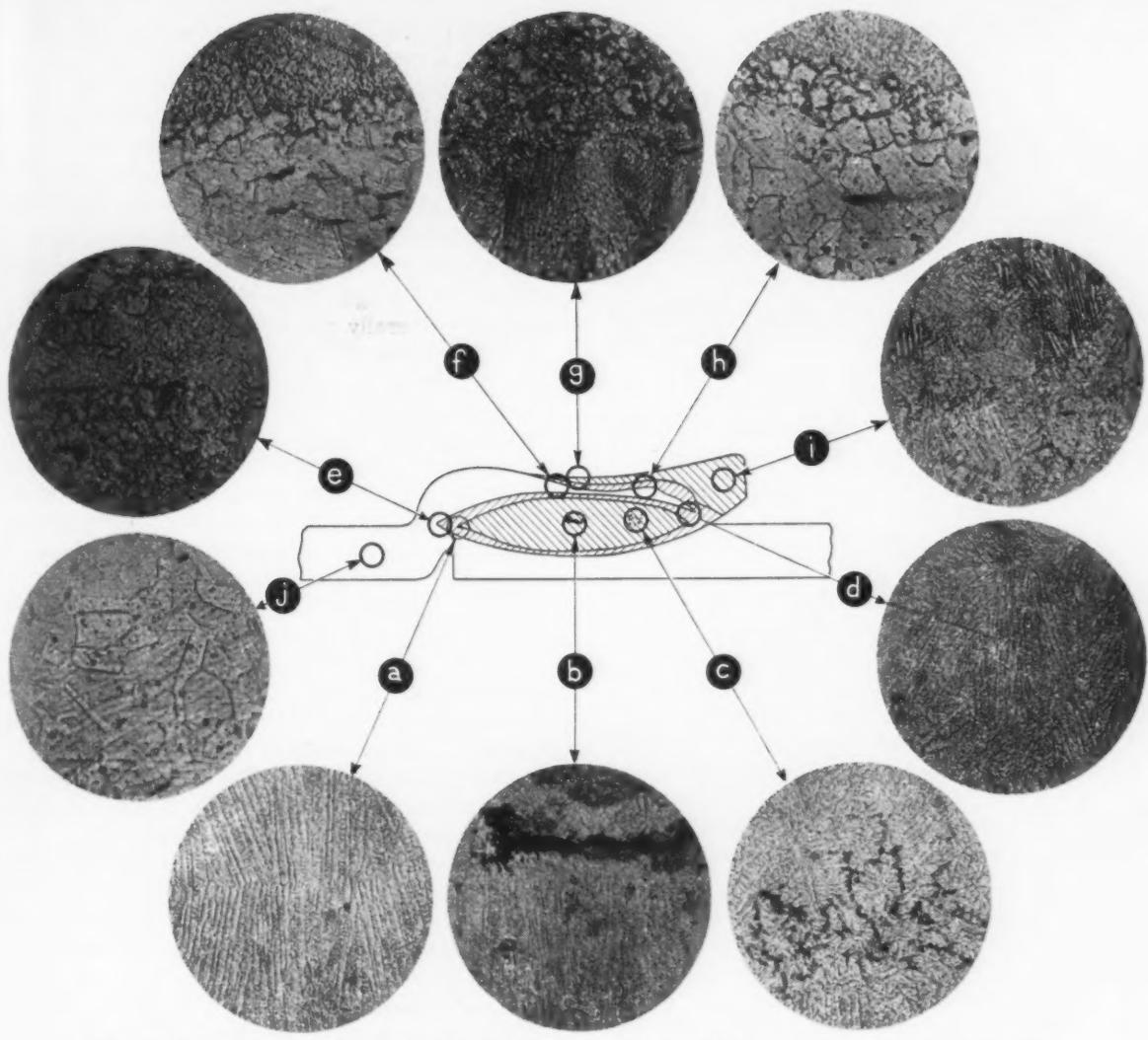


FIG. 9—A complete metallographic study of a seam weld in 0.025 in. stainless steel, type 302. The microphotographs were made at the indicated areas. 375X.

- a—Characteristic columnar structure of weld.
- b—Cavity in center of weld.
- c—Intergranular oxide condition in weld, possibly Cr_2O_3 .
- d—Portion of weld and heat affected zone.
- e—Heat affected zone on edge of weld and portion of unaffected metal.
- f—Portion of weld and small heat affected zone on outer edge of weld. The unaffected metal is satisfactory.
- g—Top weld area at its maximum width. The heat affected zone is rather wide with a few scattered carbides in unaffected area.
- h—Structure of weld. Heat affected zone in this area. Unaffected metal is satisfactory.
- i—Area affected by welding. A mixture of heat affected and actual weld structure.
- j—Satisfactory structure of type 302 stainless steel.

about 80° to the surface of the sheet, and the tip of the inner cone of the neutral flame should be not less than 1/16 in. from the surface of the molten puddle. Contact between the inner cone and the hot metal should be avoided because such contact has a tendency to overheat small areas and lead to weld porosity.

Welding is accomplished with as little disturbance or puddling of the molten metal as possible since this will increase the tendency of the melt toward oxidation and remove valuable alloys such as chromium, molybdenum and the stabilizing elements. It is also important not to stop or rework a hot weld. Preferably, a joint should be welded in a single pass. If it is found imperative to rework a pass, the partially welded joint should be reheated for a reasonable distance ahead of the

point of welding. This helps minimize warpage and stresses caused by localized heating. Such reheating should not exceed 500°F.

Gas welding is used extensively in welding lighter gages of the austenitic alloys, 20 gage and lighter, because this material is hard to arc weld. Gas welding is not recommended for the chromium grades since holding them for extended periods at high temperatures results in grain growth and brittleness. Gas welding has several disadvantages, the main being that there are too many factors left to the skill and judgment of the operator.

Greater warpage is experienced with this method, but this can be overcome somewhat by using fixtures where possible. Also, the adjustment of the flame along with a possible contamination

Continued

from the atmosphere makes it difficult to be certain that the condition of welding is neither oxidizing nor carburizing. This can be remedied somewhat by using borax as a fluxing agent. Borax or sodium borate serves as a blanket protecting the weld puddle from oxidation. Care must be taken in its use, because too heavy a layer will act as an insulator, preventing complete fusion.

The length of time that the heat affected zone is within the carbide precipitation temperature range is also favorable to the formation of intergranular carbides, but the nature of the item in regard to its ultimate service will determine the extent of precaution that should be taken. The welded structure may be of such design as to permit an anneal, or service requirements may dictate the use of a selected stainless composition such as the columbium or titanium grades.

Of considerable interest is the inert shielded arc welding method, using either argon or helium as the shielding medium. Although this method of welding has been known for many years, the scarcity and high cost of the gases restricted its use. The war brought inert gas shielded arc welding into its own in welding magnesium components for aircraft, and the changing price picture on the gases now permits the use of the process in a variety of welding applications with all types of metals.

Inert gas shielded arc welding is readily adaptable to joining stainless compositions and has been employed at the plants of Landers, Frary and Clark for the past two years in welding austenitic compositions. None of the straight chromium compositions have been welded by this com-

pany, but the problems encountered in the use of the method are characteristic of the metals themselves and similar to those encountered in other welding procedures. Direct current, straight polarity, is usually used in welding stainless, the electrode recommended being the tungsten, non-consumable type capable of carrying high current densities.

Electrode holders are both air cooled¹ and water cooled, the former preferred up to 80 to 90 amp

because of its light weight, small size and simplicity. Generally speaking, this means that air cooled electrode holders can be used for metal thicknesses up to 1/16 in., except where particularly high welding speeds and consequently high currents are involved. The water cooled electrode holder is used where current capacities up to 300 amp are required on straight polarity.

Factors governing the selection of the inert gas shielded arc welding for austenitic compositions are several. The high heat obtainable along with the excellent bead formation controllability permits the welding of thin gage materials. The high welding speeds possible contribute not only to the minimization of distortion, but also either minimize or completely eliminate harmful carbide precipitation. Simplicity of operation, the elimination of fluxing materials, the resulting high quality weld, and a marked reduction in cleaning costs after welding are significant.

Where possible, fixtures should be employed to hold the components in line and simplify operational procedures. In one specific instance involving line welding, downhand position, the two components were placed in a fixture to align the parts and, after tack welding, the inert gas shielded arc weld was run in a remarkably short time. No cooling other than air was required, since only scattered carbide precipitation within the weld zone was discernible upon metallographic examination.

In the welding job shown in fig. 10, a plug had to be joined to a tubular unit. To eliminate carbides forming in the weld, the precaution was taken of immersing the tubular unit into a trough of water. No filler electrode was used, and a snug fit was obtained. One operator and one setup man were employed so that welding was continuous. Fig. 10 shows the arrangement with three banks of troughs, each containing six assemblies to be welded. While one section was being welded, another section was made ready for welding and the third was being dismantled. To prevent water leakage, the rubber packing had to be changed frequently.

Depending upon design, inert gas shielded arc welding can be performed either with or without filler rod. Fig. 11 shows typical joint designs² that can be made with or without filler, either by hand or machine welding. Joint *b* is used extensively in machine welding, but it can be employed for hand work. The extra metal provided in either joints *a* or *c* provide sufficient material to make hand welding easy. The lap weld, joint *d*, can be produced without filler metal provided firm contact is maintained between the two lapping sheets. Since good contact is required where no filler is used, all of the other joints illustrated require filler metal, the analysis of which is similar to the base metal.

In inert gas shielded arc welding, the downhand position is preferable because it permits greater welding speed and requires less experienced operators. As with other methods of welding, the

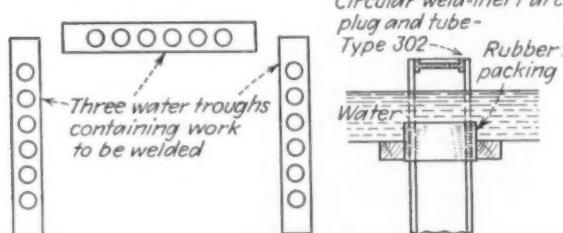


FIG. 10—For inert gas welding plugs into tubes, as detailed at right, the setup at left is used. As the operator welds a trough of parts, a helper loads a second and unloads the third.

company, but the problems encountered in the use of the method are characteristic of the metals themselves and similar to those encountered in other welding procedures. Direct current, straight polarity, is usually used in welding stainless, the electrode recommended being the tungsten, non-consumable type capable of carrying high current densities.

Electrode holders are both air cooled¹ and water cooled, the former preferred up to 80 to 90 amp

inert gas method permits welding in all positions, but, for other than downhand welding, operator skill requirements are greater and less production in terms of welded items per unit time is realized. Weld joints are satisfactory, and the results of physical tests, reported by Herbst and Pilia⁶, are interesting. They reported that test work on the physical properties of stainless steels indicated that the weld-joint in grade 302 stainless may be expected to be 90 to 95 pct that of the base metal in ultimate tensile strength. Elongations of 48 to 60 pct in the 2 in. gage length on bend specimens have been obtained. Analysis of the weld metal indicated not only no increase in carbon but, more important, no loss of chromium, nickel or other alloys. It is believed that this retention of alloys ordinarily lost in most welding processes is obtained through excellent protection of the weld puddle from the atmosphere by the inert gas.

As with other welding procedures, it is important that the weld area be thoroughly cleaned

of carbonaceous material so there will be no contamination of the weld metal and surrounding areas. Important also is the speed of welding. A higher rate of speed than the critical speed recommended will produce inferior weld deposits because of the inability of the gas to form a complete shield. Helium is usually recommended with dc, straight polarity, but argon performs satisfactorily. The choice of argon is purely economical. While the base price of helium is lower than that of argon, 8¢ per cu ft as compared to 10¢ per cu ft, in operation it is found that about 2½ to 3 times as much helium is consumed per unit time than argon, thus raising the consuming cost of helium⁶.

As indicated, machine welding is possible with inert gas shielded welding. It is well adapted for straight line welding where substantial lengths of weld are necessary. In machine welding, it is almost always necessary to use filler metal since intimate contact, necessary where no filler is used, is difficult to maintain.

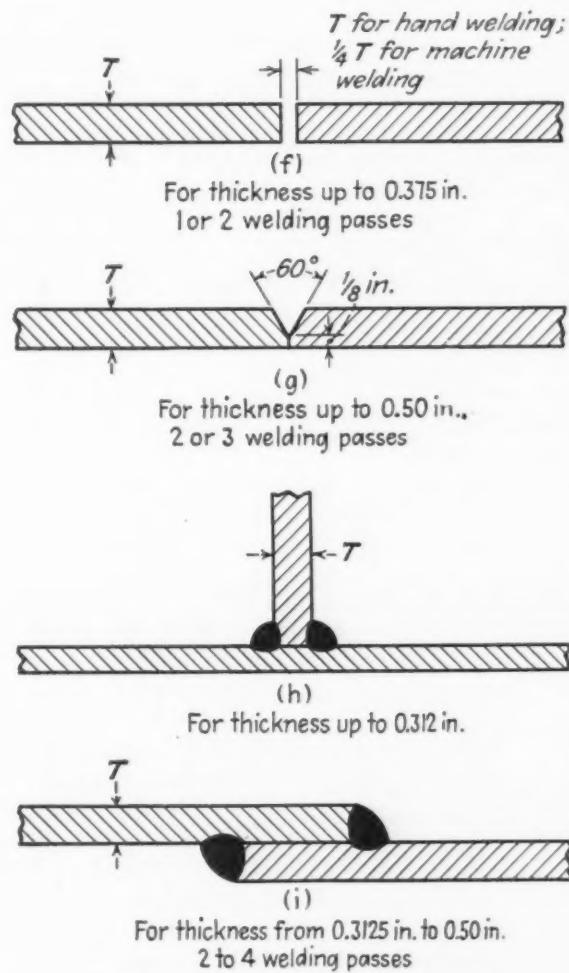
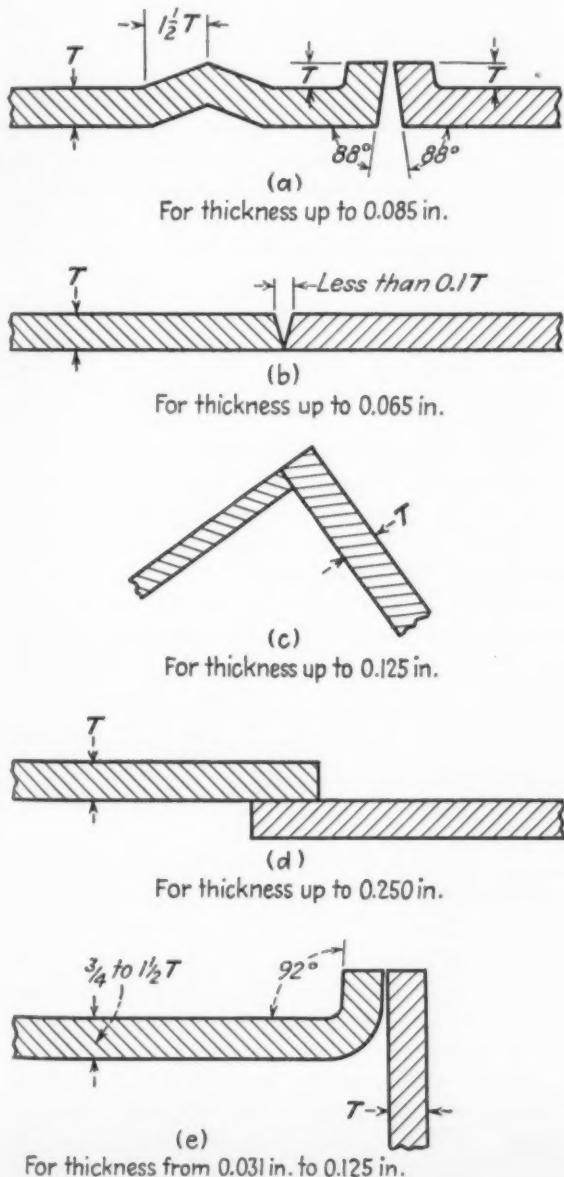


FIG. 11—Joint types for hand and machine welding. Joints a through e require no filler metal, while types f through i require filler metal.

All references for this article are tabulated at the end of part I.

Photo-Grid Method

Aids Sheet Forming Studies

AN improved photo-grid technique for determining elongation of sheet metal has been developed by the National Bureau of Standards, overcoming difficulties encountered in other methods and providing a more reliable procedure for establishing the behavior of sheet metal during forming. The new technique is also proving useful in the investigation of plastic deformation in the vicinity of holes and in studies of other structural discontinuities that result in excessive stresses.

When the National Bureau of Standards initiated the project to obtain stress-strain and elongation data for high strength aluminum alloy steel used in aircraft,¹ an accurate grid having spacings of about 0.01 in. was desired. To meet this need, a master grid was prepared at the bureau by ruling the grid in wax on plate glass, etching the lines in the glass, and filling them with lead sulfide. The grid is 2.07 x 2.16 in. overall. Grid lines are about 0.015 mm wide and are spaced nominally 0.25 mm apart. A careful study of a negative obtained from the master grid by contact printing indicated that in the middle portion, where the lines are most accurate and where measurements are taken at each line, the spacing was within ± 1 pct of the nominal value.

Investigators in the past have experienced difficulty in obtaining consistently satisfactory lines using photoengraving glue. Lines of excellent quality were obtained at the Bureau, however, with photoengraver's cold top enamel.

The procedure was developed by the Photographic Technology Section for printing lines

on tensile specimens. The specimens, thor-

¹ For technical details see NACA Technical Notes No. 1010, 1385, 1512, 1513, available from the National Advisory Committee for Aeronautics, Washington 25, D. C.

oughly cleaned and wiped with alcohol or acetone, is mounted on a whirler and coated with a small amount of cold top enamel. The whirler is then run at about 500 rpm for 10 min or until the enamel on the strip is dry. The sensitized specimen is removed from the whirler and printed in contact with the film negative of the grid in a vacuum frame. A 4 min exposure at about 12 in. from an EH-4 mercury flood lamp has proved generally satisfactory. However, the time of the exposure is affected by the relative humidity, because the enamel is less sensitive at higher humidity. Also, the sensitized specimen should be exposed and developed immediately, since it will keep but a short time.

The image is developed by immersing the specimen in agitated cold top developer (purple shade preferred) for about 20 to 40 sec. A dye in the developer makes the image on the metal visible.

Since the film negative does not maintain its dimensions during processing and during changes in relative humidity and temperature, a length equal to 50 or 100 spaces near the middle of the gage length of the specimen is measured to determine the average grid spacing. The measurements before and after test are made with a tool-makers' microscope under a 50 to 100 magnification reading to 0.001 mm.

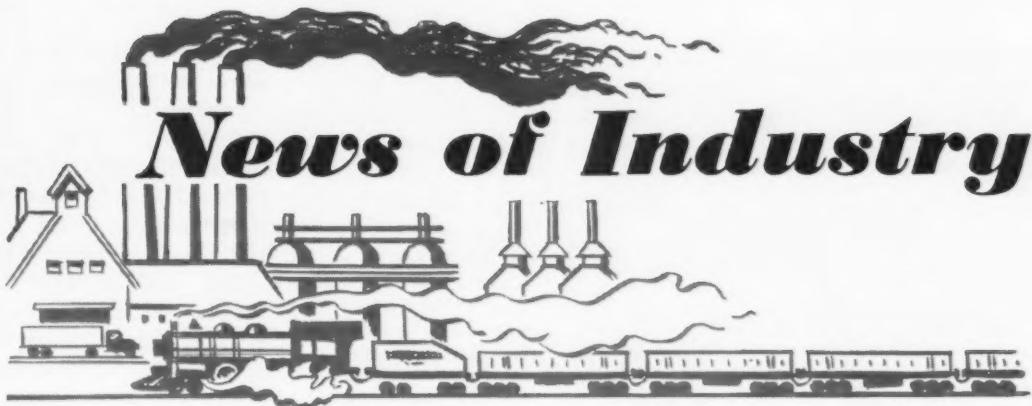
Effect of Boron Additions to Cast Iron

The effect of boron additions ranging from 0.001 to 0.48 pct on the structures and properties of cast iron are described in a report by A. I. Krynetsky and Harry Stern of the National Bureau of Standards.

Among the points brought out by the study were: (1) Undercooling increases with an in-

crease in boron; (2) increases the depth of chill as well as its hardness; (3) decreases the size and quantity of graphite particles; (4) increases the free carbide content.

The complete study is contained in report No. RP1987 of the National Bureau of Standards.



Rich Iron Ore Development Near Reality

More reserves proven this year . . . Mapping scheduled this winter . . . Railroad construction and consumer commitments delay actual mining operations.—By TOM C. CAMPBELL.

Quebec—The vast Quebec-Labrador iron ore development is now out of the fantasy and imagineering stage. There will probably be a temporary holdup in starting the 360 mile railroad from Seven Islands to Burnt Creek until the outcome of the St. Lawrence Waterway project is decided one way or the other. But the only reason for such a holdup is to save additional construction and money in case the Seaway is approved. There is no reason to believe that the railroad will not be under construction soon after the spring of 1951.

The 1949 season at the project in upper Quebec and Labrador is coming to a close this month. All this season efforts were made to map out, geologically, the main

See Iron Age, Nov. 4, 1948, p. 155, for complete report on Quebec-Labrador ore developments, also see Iron Age, Sept. 1, 1949, p. 97, for later data. The story appearing here is the latest information as the current season at the mining camps comes to a close because of weather conditions.

ore zone. A strip of about 5 miles by 70 miles was completely studied this season. Mapping will take place this winter. The completion

of this will mean that for the first time a complete geological record of the main ore body will be available.

Boost Proven Reserves

It is believed that an additional 30 million tons were proven in this year. This would place the total proven iron ore reserves at about 355 million gross tons. In the beginning the goal had been 300 million. Each year more and more evidence is accumulating that eventually more than a billion tons of ore will be uncovered. So far the proven ore represents only outcroppings and does not include large scale drilling under burden.

Additional exploration parties were hard at work in the season just closed. During some of these surveys a large amount of ore (Hollinger-Hanna people refuse to call it ore) running about 42 to 45 pct iron was uncovered in the Southwest corner of the Labrador concession. It is likely that there will be more than 500 million tons of this magnatite ore in that vicinity. But there is little or no interest in this up at Burnt Creek—not when the main body of ore

runs over 60 pct iron in most cases. It is further proof, however, that only the surface (not a pun) has been scratched in this project.

Railroad Cost Revised

There is no intention of asking the government, or for that matter of allowing it, to participate in the building of the railroad. After the road is completed and the diesel engines are running on schedule in the open months, it may be that Hollinger-Hanna will rent their

Turn to Page 82

Signs Contract With USWA

Worcester—Crompton & Knowles Loom Works, Worcester, has signed a 2-year contract with United Steelworkers of America, CIO, which specifies a non-contributory insurance plan based on a net cost to the company, including cost of current insurance and pension plans, of 10¢ per hr per employee. No general wage increase is involved.

Closes Malleable Foundry

Hillsgrove, R. I.—Warwick Malleable Co., Hillsgrove, R. I., has closed permanently, due, according to Harry K. Taylor, assistant treasurer and general manager, to lack of business and "trouble with the CIO steelworkers union." The union's sub-district director denies any friction with foundry management.



IRON ORE PROSPECTS: Shown is a shovel operator engaged in a test pitting operation to take off overburden at one of the Quebec-Labrador iron ore mining camps. Two of these Bucyrus-Erie 10-B's, each weighing 18,000 lb, were flown into the camp this year.

rolling stock to the Canadian railroads for winter use. Demand on Canadian roads in the winter almost doubles and frequent shortages of railroad equipment often result.

More than a year ago it was estimated that the railroad would cost about \$100 million. It is now believed that it will cost \$90 million or less. Of that amount maybe as much as \$40 million will be spent for rolling stock. That the engines will be diesel-electric is certain.

It has also been established that ore can be turned out of Burnt Creek in 4 years from the start of actual railroad building. But should an international emergency arise it is also certain that ore could be on the tracks and rolling to American steel mills in 3½ years.

Commitments Caused Delay

Early delay on the project was encountered because it was necessary to get actual commitments from probable users of iron ore. With the Mesabi range still a great producer, and with many steel companies in the States apparently not worried too much about ore shortages, it has been

hard to get them to talk business.

Things seem to be changing rapidly now. Republic Steel Corp. looks like a sure bet for an important role in the iron ore project. No actual papers have been signed but it is known that they are more than "actively interested." Charley White and Don Gillies have never been known to turn down a good bet.

Prices Seen Competitive

There is still plenty of room for others if the minimum of 10 million tons of ore is to be brought down each year. Great Britain long ago agreed to take about 2 million tons. New England people have said that they would be in the game for at least a million tons—after the question of a steel plant there is settled. These three probable buyers of ore will account for about 5 million tons. The balance of the shipments will have to be made to other American steel plants. Already Armco and Wheeling have shown more than casual interest.

Neither U. S. Steel nor Bethlehem have come in on the Quebec-Labrador development but that doesn't mean they won't, eventually. U. S. Steel's Venezuela strike

is much farther away from actual development than Canadian development, according to recent information. It may be that U. S. Steel will have to build quite a railroad itself in South America if it wants to avoid a battle with silt-filled rivers and harbors.

But one of the most recent events which gives the Hollinger-Hanna boys a lift is the attitude of both Quebec Province and the newly admitted province of Newfoundland. Both have signified that they will offer all help possible.

Studies have been made by various sources on the competitive position of iron ore from Burnt Creek compared with Mesabi ore laid down at Pittsburgh. Based on the iron ore content there is evidence that Labrador ore can be competitively laid down at Pittsburgh even if a combination rail and water transportation is used. If the St. Lawrence Waterway is built other sources claim that Labrador ore can be laid down in Pittsburgh at a unit basis for as much as 25¢ to 65¢ less a ton if toll charges are not included. Toll charges would cut this down. If toll charges were too high on the Seaway they might seriously affect the entire transportation probabilities. Shipment of Labrador ore to Eastern United States ports will be no problem at all.

Sloss-Sheffield Reports Income

Birmingham — Net income of Sloss-Sheffield Steel & Iron Co., Birmingham, for the third quarter of 1949 amounted to \$403,148.39 after estimated federal income tax. Net income after federal income tax for the 9 months ended Sept. 30, 1949, was \$1,790,891.02.

C. W. Jeffers Named to ECA

Washington — Charles W. Jeffers, formerly a mining engineer with the Hanna Coal Co. and other firms in Ohio and West Virginia, has been named to head ECA's industry division. He has been chief of the coal branch since last December.

Auto Plants Receive Record Steel Shipments

New York—Shipments of steel products to automotive manufacturers in the first 6 months of 1949 were larger than in any previous half-year, according to the American Iron & Steel Institute.

The total of nearly 5.9 million tons to the automotive industry in the first half of 1949 was nearly 1 million tons or 20 pct greater than in the first half of 1948 and 600,000 tons over the second half of 1948. The half-year shipments were equal to more than 17 pct of total steel shipments, compared with 15.2 pct in the first half of last year.

Total shipments of steel in the 6 months were over 33.6 million tons, an increase of over 1.3 million tons from the first half of 1948.

Honored by Gray Iron Founders

Cleveland—George W. Cannon will be honored by the Gray Iron Founders' Society, Inc., for his contribution to the general welfare of the industry. The Society's highest honor, the Gold Medal Award, will be presented to Mr. Cannon at the Society's 21st annual meeting at the Edgewater Beach Hotel, Chicago, Oct. 28.

Will Discuss Titanium Enamels

Baltimore—"Titanium Enamel and Its Application Direct To Steel" is to be the feature subject at the first fall business meeting of the Eastern Enameler's Club to be held on Dec. 3. The meeting will take place at Hotel Sylvania, Philadelphia, starting at 12:30 p.m.

May Receive Repair Business

Boston—New England machine shops may soon receive a \$500,000 order for the repair of obsolete textile machinery to be shipped to Europe, according to the Smaller Business Assn. of New England. Maurice J. Taggart of the Manufacturing Assn. of New England said the order is still being negotiated.

INDUSTRIAL SHORTS

GIANT PRESS—The National Tube Co., Pittsburgh, has awarded a contract to the HYDRAULIC PRESS MFG. CO., Mt. Gilead, Ohio, for an 18,000 ton hydraulic press, believed to be the largest in the United States. Pipe up to 36 in. in diameter, 40 ft long with $\frac{1}{2}$ in. wall thickness will be formed.

NEW GADGETS—John K. Bruce will head the newly formed BRUCE ENGINEERING CORP. with offices in San Francisco and Pasadena. They will produce specialized marking and handling equipment, the first of which is an automatic can marker which can be sold for a fraction of the cost of conventional equipment. Another is an automatic machine to open packing cases and transfer empty cans to conveyor lines.

MONEY WELL SPENT—Completion of a program of plant expansion and equipment improvement, estimated at \$250,000, has substantially increased the capacity of the gray iron foundry operated by the AMERICAN FURNACE & FOUNDRY CO. and AMERICAN BOILER & FOUNDRY CO., Milan, Mich.

UNITED BUYS—Stedman Foundry & Machine Works, Aurora, Ill., has been purchased by the UNITED ENGINEERING & FOUNDRY CO., Pittsburgh, involving approximately \$1 million. K. C. Gardner, president of United, has been named chairman of the board of the new acquisition and G. G. Beard will be president.

GROUP LEADERS—The St. Louis chapter of the INSTITUTE OF SCRAP IRON & STEEL INC. has elected Charles Forcheimer of Jack R. Forcheimer & Son as president, succeeding Samuel I. Lefton of B. Lefton & Sons Iron & Metal Co., who was named chairman of the executive committee.

AWS OFFICERS—O. B. J. Fraser, assistant manager, Development & Research Div., International Nickel Co., Inc., New York, has been elected president of the AMERICAN WELDING SOCIETY. Harry W. Pierce, assistant to president, New York Shipbuilding Corp., has been named first vice-president and Charles H. Jennings, second vice-president.

NEW SETUP—A change has been made in the sales and manufacturing structure of JAS. P. MARSH CORP., Skokie, Ill., whereby it will become the manufacturing division serving three selling and distribution organizations. The Electromatic Co. will handle sales of refrigeration control valves and regulators; Marsh Instrument Co.—gages and related products; and Marsh Heating Equipment Co.—heating specialties.

WELCOME BACK—Donald R. Wadle has resumed the position of commissioner of the METAL LATH MANUFACTURERS ASSN., Cleveland, following a year's leave of absence because of illness.

OPENING IN SEATTLE—Announcement has been made by LYON METAL PRODUCTS, INC., Aurora, Ill., of the opening of a new warehouse in Seattle at 1755 Utah Ave.

SALES BRANCHES—New sales and field engineering offices at Cleveland and Philadelphia have been established by GRAVER WATER CONDITIONING CO., New York, manufacturers of equipment for all water treatment and liquid conditioning processes. Herman Ross will be in charge of the Cleveland office and Robert Schenker will head the Philadelphia office.

TOOL AGENT—Carboloy Co., Detroit, has appointed W. L. REYNOLDS CO., Baltimore, specialists in cutting tools, grinding wheels and abrasives, as a distributor.

Devaluation Restricts Venture Capital in Canada

Ottawa—An official of the Dept. of Trade and Commerce stated that the increased volume of British capital and manufacturing knowledge pouring into Canada has been completely dissipated by devaluation of the pound. The new exchange rate has made the British industrialists adopt a "wait and see" attitude. Canadian officials are not happy about what they see as they wait.

The British manufacturer, after devaluation, can transport and sell his products in Canada more cheaply than if he started a branch here. British capital investment in Canada is now more than \$600 million, representing about 530 firms. Firms which earlier in the year had appeared eager to move into the Canadian industrial field, now are content to manufacture at home. Despite ocean transportation costs, some Canadian firms are contending that British firms can now undersell them on their home market.

Devaluation of the Canadian dollar has brought renewed inter-

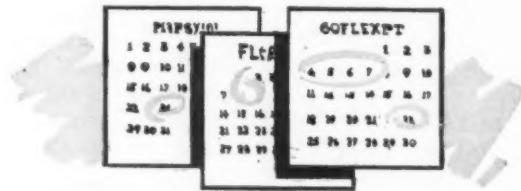
est from the United States with inquiries to the department slightly above the normal number. The Imperial Oil pipeline project has brought inquiries from several parts manufacturers. Other U. S. inquiries concerned light industries such as luggage and bearing manufacture.

In each case the stumbling block is the Canadian import restriction on parts necessary to complete the item of manufacture. There are more than 2000 U. S. branch plants in Canada now, with a total investment of more than \$2 billion. Of this number more than half are manufacturing plants, but few produce the complete product in Canada.

ECA Allots England \$351 Million

Washington—Great Britain has received an additional \$351 million in Marshall Plan funds under the second allotment of 1949-1950 appropriations.

Another \$257 million has been set aside for France and her overseas territories, the second largest individual beneficiary of the ECA program. About \$150 million has been reserved for use of Italy.



Dates to Remember

- | | |
|------------|--|
| Oct. 27-28 | Gray Iron Founders Society, annual meeting, Chicago. |
| Oct. 27-28 | Porcelain Enamel Institute, annual meeting, French Lick, Ind. |
| O.t. 27-29 | American Society of Tool Engineers, semiannual meeting, Montreal. |
| Oct. 28-29 | Engineers Council for Professional Development, annual meeting, Chicago. |
| Oct. 30- | National Tool & Die Manufacturers Assn., annual meeting, New York. |
| Nov. 2 | |
| Oct. 31- | Packaging Machinery Manufacturers Institute, annual meeting, Chicago. |
| Nov. 2 | |
| Oct. 31- | American Institute of Steel Construction, annual convention, White Sulphur Springs, W. Va. |
| Nov. 3 | |
| Nov. 7-10 | American Institute of Chemical Engineers, annual meeting, Pittsburgh. |
| Nov. 10-11 | National Foundry Assn., annual meeting, New York. |
| Nov. 30- | Society for Experimental Stress Analysis, annual meeting, New York. |
| Dec. 2 | |
| Dec. 8-10 | American Institute of Mining & Metallurgical Engineers, Electric Furnace Steel Committee, annual conference, Pittsburgh. |

Foundry Output Steady; Suppliers Cut Coke Shipments

Chicago—Foundries in this area as yet have not felt the effects of the steel strike but the coal strike is beginning to pinch. Coke suppliers not on strike in the midwest have cut their shipments from 85 to 25 pct of the prestrike tonnages that were being shipped to the foundries. The longer the coal strike lasts, the tougher it is going to be and industrialists here point out that we have already had the equivalent of a 2½-month old coal strike.

So far, with most of the merchant iron furnaces running, pig iron has not yet become scarce. However, the output of these furnaces will diminish as coke supplies go down so that eventually the foundries will have a twin headache. Demand on the foundries for their products has remained pretty steady during the first 2 weeks of the strike but this demand is expected to taper off sharply by the end of the month as their customers run out of steel products to make the finished article. Should the coal and steel strikes not be settled by early November, foundry output will start to decline sharply and by the end of the month their operations will be very low.

Congress Votes Stockpile Funds

Washington—Power to buy and to contract for an additional \$735 million worth of critical and strategic materials for the national stockpile during the fiscal year 1949-50 has been voted by Congress.

Some \$315 million was appropriated for cash purchases of materials. The remaining \$420 million voted was in the form of contract authority.

In a separate action, the Congress approved a deficiency appropriation of \$250 million with which the Federal Bureau of Supply would take up contract commitments made during last fiscal year.

K-F Gets New RFC Loan To Help Market Its Autos

Washington — Kaiser-Frazer Corp. this week obtained a \$10 million loan from the Reconstruction Finance Corp. The funds will be used to help finance dealers who want to market the companies' automobiles.

This is the second RFC loan to be granted K-F this month. The previous loan was for \$34.4 million. It will be used to help finance production of a low-priced car.

GE's Sales Up, Net Declines

Schenectady — General Electric Co.'s profit for the first 9 months of this year amounted to \$67,612,879, or 19 pct less than the \$83,893,459 earned in the like period of last year. These respective amounts are equal to \$2.34 and \$2.91 on each share of common stock.

Net sales billed during the first 9 months this year totaled \$1,190,372,404, or 5 pct more than the total of \$1,137,935,052 billed in the same period of last year.

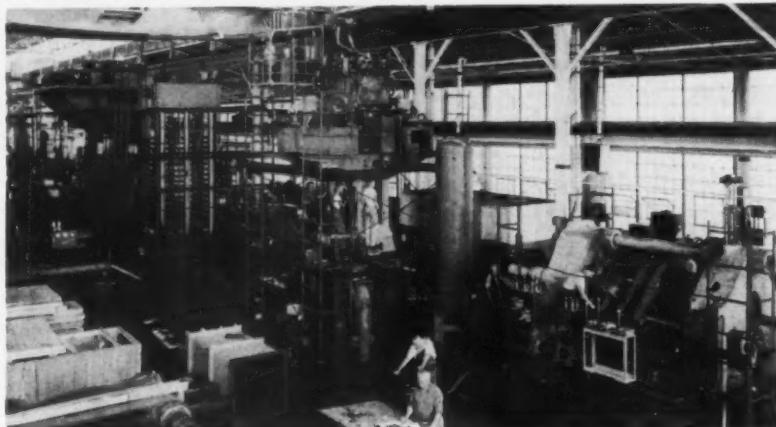
Sets 45-Year Sales Record

Detroit — Reflecting new aggressive sales policies and also the high rate of construction activity, Detroit Steel Products Co.'s shipments of building products in September were the largest in the company's 45-year history, E. C. Hodges, vice-president in charge of sales, reports.

J. L. Collyer Elected Trustee

Akron, Ohio — John L. Collyer, president, The B. F. Goodrich Co., has been elected a trustee of the Alfred P. Sloan Foundation.

The foundation, named for the chairman of the board of General Motors, was founded in 1936 and since that time has expended \$9 million in grants. In 1947-48, the foundation dispensed more than \$2 million, about half of the amount going to the Sloan-Kettering Institute for cancer research.



\$1 Million in Presses on Lake Erie Assembly Floor

Buffalo — Assembly floor of Lake Erie Engineering Corp.'s Buffalo plant shows almost \$1 million worth of presses nearing completion for purchasers whose end products range from newspapers to automobile bumpers and from secret parts for aircraft to Brazilian coins.

The largest press in the group is at the left rear, a 2000-ton single acting unit with a 500-ton hydro-pneumatic die cushion. Electric Auto-Lite Co. will use it at Sharonville, Ohio, to make automobile bumpers. The advent of the wrap-around bumper calls for increasingly larger presses. This press has a 40-in. stroke and a 72 x 138-in. bed.

Just to the left of the 2000-ton press is a carbon electrode flying shear developed in collaboration with Great Lakes Carbon Co., for installation at Morganton, N. C. It is designed to cut 20-in. diam electric furnace electrodes. Top and bottom shear blades and movement of the carriage and knife housing are hydraulically controlled.

At the right is a brass extrusion press for the Brazilian mint, similar in design to one recently supplied by Lake Erie to Oak Ridge. Rated at 1000 tons, it will extrude brass strip from billets up to 5½ in. in diam. It has a 23-in. stroke and is furnished with its own accumulators.

Two 3000-ton, hydro-dynamic forming presses are about completed, one for S. P. Whistler & Sons, Inc., Buffalo, and the other for Lelance & Grosjean, Woodhaven, L. I. These presses incorporate a hydraulic forming technique. After the down stroke of the ram holds the blank in position over the die hydraulic fluid is injected to form the part into the die. Presses of this type have been widely used in forming the raised characters in signs as well as for far deeper draws.

To many a production man the design of an entirely new high speed double action hydraulic press and its complete manufacture, assembly and testing within 10 weeks from receipt of an order might seem remarkable. Yet the first of a battery of such presses for automotive parts making is shown nearing completion just 9½ weeks after the contract was signed.

Lake Erie engineers explain that it is possible to produce such rather complicated units—including preparation of working drawings, layout of hydraulic and electrical circuits, patternmaking, procurement of purchased parts, assembly and testing—in a relatively short time because each job is based on components that are used repetitively in nearly all of its press construction. This also brings costs of most presses well below what they would be if each job had to be completely engineered from the ground up.

Tool, Die Manufacturers Assn. to Hold Annual Convention

New York—The National Tool & Die Manufacturers Assn., composed of approximately 500 contract manufacturers of special tooling for industrial mass production, will hold its annual convention at Hotel Statler, New York, from Sunday, Oct. 30 through Wednesday, Nov. 2.

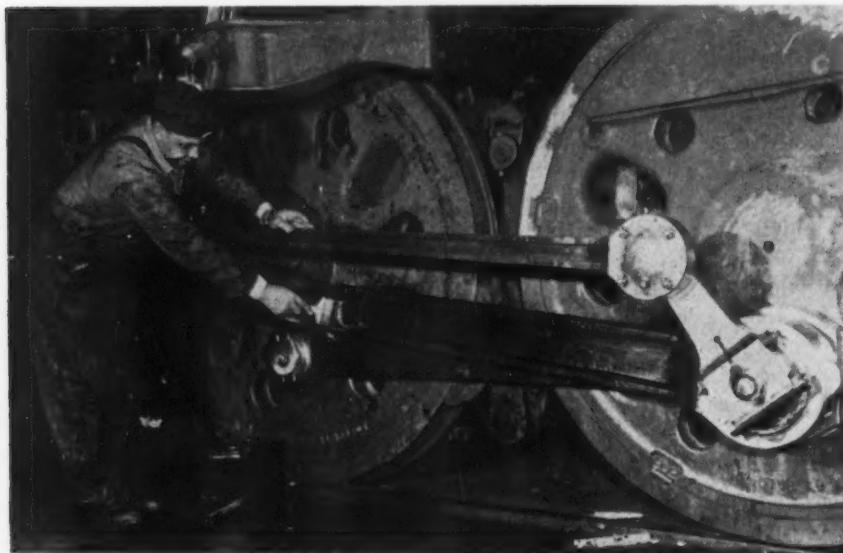
Gene Flack, sales counsel and director of advertising of Sunshine Biscuits, Inc., New York, will speak on "The Time is Now" at the Monday luncheon session.

At the Monday afternoon business session, Paul Hatch, sales director for Brown & Sharpe Mfg. Co., Providence, will speak on industrial marketing.

L. R. Boulware, vice-president in charge of employee relations of the General Electric Co., will speak on "Management on the March" at the luncheon meeting on Tuesday.

Another highlight of the Tuesday afternoon session will be the address, "How Serious is This Threat of Socialization," by Dexter Keezer, director of the economics staff of McGraw-Hill Publishing Co.

PITTING PREVENTED: Locomotives shipped from this country to India used to suffer damage in the form of pits during the long salt water haul. But not any more. In conjunction with E. F. Houghton & Co., Baldwin Locomotive works has solved the problem by applying a double cosmoline coating to moving parts. Undercoat is Cosmoline 266, which is a finger print neutralizer. The heavier outside coat is Cosmoline 282 C. The first shipment so protected is reported to have arrived in perfect condition.



Both Monday and Tuesday afternoons will be devoted to panel discussions on tool and die shop problems. "Business Problems of Tool and Die Manufacturers" will be the Monday topic, and "Employer-Employee Relations" will be discussed Tuesday.

In addition, various committees of NTDMA will meet to discuss the different aspects of the tool and die business, and new officers for the coming year will be elected. J. J. Kohl, president of International Tool Co., Dayton, Ohio, is the current president.

Austria Receives ECA Funds

Washington—Austria has been authorized by ECA to use \$11 million (110 million schillings) of her counterpart funds for industrial expansion.

About \$3.2 million will go into rebuilding and expansion of iron and steel facilities. Another \$600,000 will go for improvement of the nonferrous metals industry and \$2 million for development of chemical production.

In addition, ECA authorized use of \$7 million for hydroelectric power, \$5 million for railroad development, and \$3 million for housing.

Scrap Seminar Acquaints Students With Trade Matters

New York—More active participation by junior executives of the iron and steel scrap industry in the meetings and the affairs of the Institute of Scrap Iron & Steel Inc., the national trade association of the scrap industry, is reported to be one of the unexpected but gratifying byproducts of the seminar on scrap which the institute conducted at Northwestern University, Chicago, from Aug. 28 to Sept. 2.

At recent chapter meetings, reports on the seminar were presented by graduates of the course.

The seminar conducted by the institute, from which 222 were graduated, was designed to provide background. These junior executives were lectured on the history and background of the scrap industry, the scope and role of the scrap institute, the functions of scrap in various types of furnaces, the origin of scrap and its preparation and shipment, freight rates, world trade, industrial and public relations, insurance, administrative and accounting procedures of brokers and dealers, segregation of nonferrous metals, demolition and slag dump recovery, collateral activities of dealers, economic mobilization of industry for defense, and a general approach to economics.

A field trip to the Gary Works of Carnegie-Illinois Steel Corp. was arranged so the students could learn the importance of segregation and preparation of scrap to specification.

Plan New England Conference

Boston—A discussion about the proposed \$200 million New England steel mill will be a highlight of the 25th New England Conference here Nov. 17 and 18.

Besides the six New England governors, guest speakers will include Secretary of Defense Louis Johnson. The New England Council's steel committee will submit their report on the proposed mill at that time.

Metals Market Brisk Despite Steel Strike

Brass mills running at twice last spring's rate . . . Brisk copper sales are surprise . . . Buying is for current needs . . . Zinc purchases are sustained—By JOHN ANTHONY

New York—Faced by the immediate prospect of general shutdowns by metal fabricators in the wake of the steel strike, the current heavy demand for mill products and some nonferrous metals is an anomaly.

The brass mills today are operating at a rate estimated to be 100 pct higher than last spring. Their deliveries are lengthening due to the relatively high rate of operations and extended deliveries for their copper requirements.

No Advance Ordering

Ordering by consumers reflects the current high rate of industrial operations, and the need to buy for immediate consumption after the months of running working inventories into the ground during the spring and summer. Consumers are not yet buying for inventory accumulation, even though mill products and metal prices are on a plane far below those of 8 months ago. As much as 95 pct of current orders for mill products are for immediate delivery.

There is no advance ordering to speak of because consumers sense that the steel strike might last long enough to force them to close down. If this should become general, there is no doubt that metals prices would tumble again. But in the rush to replenish working inventories after the end of the strike, it is quite possible that the pressure for delivery would build up prices beyond present levels. If the strike should last long enough to jeopardize confidence in the recovery now under way, it is also possible that this buying rush may never develop.

Copper buying during the last few months has been heavier than expected by the most optimistic

market prophets. Deliveries to domestic consumers have been very close to the peak rates established during the postwar period. Mine producers are reopening some of the properties closed down during the inventory reduction period. But the chances are that mine production of copper here and abroad will not reach peak levels until some time after the end of the steel strike. In the meantime, refined copper inventories have started to drop sharply. Production of crude copper in the United States and outside was reported by the Copper Institute to have increased by nearly 10,000 tons in September. But this figure of 157,000 tons is nearly 30,000 tons below April production.

Copper Market Is Strong

The strength of the copper market is indicated by the shortage of copper scrap and the recent price rises. There may be a sudden reversal of this trend when

scrap resulting from present heavy mill product fabrication comes into the market. But unless the steel strike comes to an end within a few weeks, this development will be obscured by the rapidly accelerating wave of fabricator closings.

The most unusual aspect of the metal markets at present is the sustained buying of zinc in good tonnages at a time when the steel industry and galvanizers are almost entirely out of the market. The heavy buying by the brass mills and die casters has effectively stopped further price declines in the last few weeks. It has not been long since galvanizers furnished the principal support to the zinc market. But with renewed mill products buying, and heavier business in die castings, the market is considerably stronger now.

Brass Mills Buy More Zinc

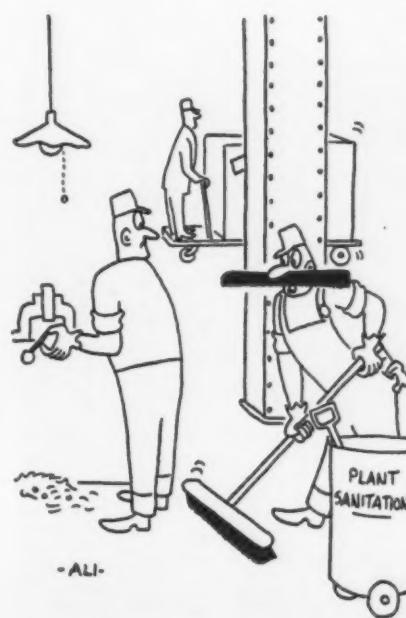
This will also change when the automotive industry and other metal fabricators are forced to curtail their operations. At present, brass mills are using an estimated 2 to 2½ times their summer consumption of zinc. They are also eating rapidly into their heavy inventories of brass scrap.

The one soft spot in the metal markets right now is in lead which has suffered heavy inroads from foreign producers offering tonnages below the domestic market. At the same time, lead buying for replacement batteries has about come to the end of its season.

Copper Export Rules Amended

Washington—Effective Oct. 7, export regulations have been amended to provide that license applications must include a statement of the weight in pounds of the copper contained in building wire and cable, weatherproof and slow-burning wire, and insulated copper wire, n.e.s.

Another amendment, effective on the same date, likewise provides that export applications for chemicals containing lead must specify actual lead content.



New Wage-Hour Law Raises Minimum Wage to 75¢ Per Hr

Washington — President Truman's signature last week on a bill to raise the national minimum wage from 40¢ to 75¢ per hr will mean pay raises for about 1,500,000 workers.

However, the number of workers covered by the new Wage-Hour Act is expected to remain at about the same level. New classes of wage earners, such as fish canners, are added to coverage provided by the law, but others, like cab operators and newsboys, are exempted. At present, the law applies to about 23 million workers out of a total labor force of some 60 million.

Under the new act, a number of types of compensation are excluded from the definition of "regular rate" of pay. Excluded from "regular rate" computations are gifts and payments in the nature of gifts, payments to employees for occasional absences and for expenses incurred in furtherance of the employer's interests, bonuses paid in the sole discretion of the employer, payments under bona fide profit-sharing plans, irrevocable contributions to pension or retirement funds, and premium compensation paid at not less than time-and-one-half the nonovertime rate for work performed in excess of 40 hr per week.

William R. McComb, Wage-Hour Administrator, said the new law would mean "direct wage increases averaging from 5 to 15¢ an hr" for the 1,500,000 workers already under protection of the Wage-Hour Act.

Russia Ships Less Manganese

Washington—Russian shipments of manganese and chrome ores in August declined to \$400,000 worth after rising to \$1 million in July. Imports from Russia as a whole declined by a half-million to \$3 million for the month, the Census Bureau says.

Trade as a whole between the United States and Eastern Europe

fell off by \$3.5 million in August. Exports to Russia and the satellite nations declined by \$3 million to \$6.5 million. Imports from those countries declined by a half million to \$8.3 million.

Army Offers Excess Real Estate

Washington—The Army Dept. has declared as excess to its needs some 75 parcels of real estate located in 10 coastal states and formerly included as part of harbor defenses.

Full information may be obtained from division engineer officers at Boston, New York, Portland (Ore.), and Oakland. Properties are located in California, Washington, Virginia, New York, New Jersey, Delaware, Maine, Massachusetts, Rhode Island and New Hampshire.

Fuel Requirements Set Record

New York—The steel industry consumed record amounts of fuel oil, electric power, coal and coke

BREATHER. Lee Crane, left, of the industrial relations department, The National Supply Co., Ambridge, Pa., adjusts a new type oxygen breathing unit on Sgt. William Bofinger of the plant protection force. The device is a product of Mine Safety Appliances Co., developed during the war for the Navy. It weighs 13 lb, needs no outside air, and has no high pressure cylinders, valves or fittings.



during 1948, according to the American Iron & Steel Institute.

The 97,659,000 tons of coal consumed during 1948 were 3,386,000 tons more than was used in the previous year. More than 23 million kw-hr of electric power were consumed last year by iron and steel plants, 10.3 pct more than in the previous record year of 1947.

The use of fuel oil increased more than 37 million gal over the 1947 record to nearly 2.2 billion gal. During the year, 274.5 billion cu ft of natural gas were consumed or 7.4 pct more than in 1947. Consumption of tar and pitch, at 296,325,000 gal, was 11.3 pct greater than in 1947.

Home Building Tops Last Year

Washington—For the first time since May 1948, the number of new homes started in any one month reached the 100,000 mark in September. This brought the total for the year to 743,000—about 2000 more than for the first three-quarters of 1948.

With reasonably open weather, it is expected that the final figure for 1949 may now exceed the 931,000 units started last year. It is also expected that the effect of the public housing program will begin to be felt in closing months of 1949.

During the first 2 weeks of October, the Public Housing Administration approved applications from 22 local authorities, setting aside reservations for an additional 7200 dwelling units under the public housing program.

Austria Asks for Sealed Bids

Washington—Effective immediately, the Austrian government has put into practice a new policy of purchasing goods bought with Marshall Plan funds. It will ask for sealed bids.

While this assures Austria of getting goods for the lowest price possible, in effect it actually does not affect purchasing procedures to any appreciable extent. Purchases will continue to be made through Austrian importers.

Presidential Strike Action Anticipated

His task is urgent because steel and coal tieups are now approaching disaster proportions . . . Difficult because the principals show no sign of giving in.—By JOHN B. DELANEY.

Pittsburgh—Apparently convinced that nothing short of personal intervention will end the steel and coal strikes, President Truman was expected this week to throw the full prestige of his office into the fight to break the deadlock.

His task was both urgent and difficult, for two reasons:

1. Economic effects of the twin strikes, already serious, are snowballing to the proportions of a full-fledged disaster.

2. Principals in the disputes have given absolutely no indication that they intend to retreat from the positions that led to the walkouts. Quite the contrary.

It seemed likely that the President would first attempt persuasion. Failing that, it was speculated, he might reluctantly resort to the "Taft-Hartley Act, which is No. 1 on organized labor's "hate" parade.

With the steel strike now in its fourth week and the coal strike in its sixth, the nation was running downhill economically:

Wage Loss Near \$300 Million

Loss of wages to idle workers in basic steel and soft coal, on the basis of a 5-day week, was approaching \$300 million. Government economists estimated that this blow to purchasing power, plus layoffs caused by steel and coal shortages, will have made 2-million workers idle by this weekend.

The automobile industry began to cut back operations. General Motors was working a 4-day week in six plants and expects a complete shutdown by Dec. 1. Ford expects to close Nov. 15 and Chrysler about Nov. 1. Harry C. Markle, Michigan's unemployment director, said 300,000 may be idle in the Detroit area soon.

The Interstate Commerce Com-

mission ordered a 25 pct reduction in operation of coal-burning passenger locomotives to conserve fuel. This means more railroaders out of jobs.

Mediation Efforts Fail

In steel, where the strike centers over whether pensions and social insurance shall be contributory or non-contributory, Cyrus Ching, Director of the Federal Mediation and Conciliation Service, busied himself in discussion with Bethlehem and U. S. Steel in an effort to effect a settlement, but apparently got nowhere. The CIO United Steelworkers announced that 18 more companies, including Copperweld Steel Co., have agreed to the 6-4 pension-insurance formula, and the company's Glassport, Pa., plant reopened. The agreement did not cover Copperweld's Warren, Ohio, plant, which remained strikebound.

In coal, negotiations involving northern and western operators collapsed with a bang. George H. Love, president of Consolidation Coal Co., and chief operator negotiator, said the owners were walking out because their best bid—"we can't pay more"—is renewal of the existing contract. John L. Lewis, president of the miner's union, wants contract improvements he estimates will cost 30¢ to 35¢ a ton.

Building Activity Up 10.8 Pct

Boston—Building activity in Massachusetts in September rose 10.8 pct over August and jumped 22.8 pct over the same month last year, the Massachusetts Dept. of Labor and Industries has reported. Of the \$24,840,650 to be spent for construction in September, \$13,934,630 was for new residential building.

The Battle of Words

From the speeches and statements of industry and labor leaders involved in the steel and coal strikes:

IN STEEL

Philip Murray, president of the United Steelworkers of America—"The steel industry is not big enough to lick the people of this country. The sooner they realize it the better off the country is going to be."

Irving S. Olds, chairman of the board, U. S. Steel Corp.—"The sole issue on which Philip Murray closed down the steel industry . . . was the unwillingness of the industry to agree in advance that it will pay the entire cost of social insurance and pensions for employees. We have made a very liberal proposal and the steelworkers have turned it down flat. It's up to Phil Murray to make a proposal, not us."

Edward L. Ryerson, chairman of the board, Inland Steel Co.—"Does anyone know what this steel strike is about? In view of the liberal offers which steel companies have made, this is not a strike to secure a pension and insurance plan for steel workers."

IN COAL

John L. Lewis, president, United Mine Workers of America—"We are willing to fight this out. The mine workers can whip these coal operators, rich and powerful as they are, if we are left alone. But if we are not left alone, then we ask fair treatment."

George H. Love, president, Consolidation Coal Co., and chief negotiating spokesman for northern and western coal operators—"In his mad race for power John L. Lewis is impoverishing our employes and is willing to destroy the coal industry. Therefore, we are leaving this conference."

Viewing the News from

The ECONOMIC SIDE

By JOSEPH STAGG LAWRENCE

"Juggled Logic"

In an earlier story we noted the facility with which labor juggled its logic in working up steam for its case. On one occasion it used rising living costs on which to base a drive for higher wages; on another, high corporate profits. Now the full sound and fury of labor propaganda beats about the high pensions which steel executives draw. The angry indictment further alleges that cold-blooded steel management fails to provide for superannuated labor as it provides so universally for aging equipment.

The argument that management should set aside each year a stipulated amount to provide for the retired worker, even as it sets aside similar amounts in the form of depreciation on inanimate equipment, is plausible. Its appeal as valid logic varies inversely with the intelligence of the audience. The analogy is completely off the beam.

The amount which the accountant sets aside each period in the form of depreciation is a charge against income. So are wages. Here the analogy stops. A lathe cannot budget the payment for its services because it gets no such payment. With each job its useful life is diminished. It is confronted by the constant risk that someone may build a better lathe which will relegate it to the scrap heap. Unless the accountant sets aside a periodic charge to income for depreciation and obsolescence, the plant will find itself eventually without equipment and the worker without a job. Depreciation, therefore, insures the integrity of the plant equipment account.

A pension serves no similar purpose. It does not provide for the replacement of a worker who has served his time. The pension, therefore, constitutes a net drain on the income of the business. The books of the company can show no value rendered for the pension payment.

The depreciation reserve belongs to the company. It is one of the prudent provisions of management which assures the continued operation of the enterprise. The pension reserve belongs to the worker. It does not bind the worker to the company. In fact, under most pension plans the worker acquires a vested right to pension accumulations. He can take another job and carry his pension rights with him. When a piece of equipment is sold, it is sold on a depreciated basis. The former owner retains the depreciation reserve, thereby recovering from the sale price and the reserve enough to replace the equipment.

The pension demands of the steel workers as well as the coal miners, in an actuarial sense, are blind payments into a fund. They do not take account of the rate at which the members of the working force cross the threshold of retirement. A sound fund requires payments from the moment a man takes his first job. Only after the fund has accumulated throughout a man's working life can it have the substance necessary to meet the pension requirements of the worker until he dies. A sound fund, established on any given date for an entire working force of mixed ages, calls for capital payments for past service. Unless this is done the fund is a phony, as has been demonstrated by the miners' pension fund.

There are other differences between the man and the machine. The former has the power of will and the gift of foresight. Well-managed savings institutions and insurance companies make it possible for the worker to provide for his own old age, something no machine can do. Have you ever heard of a machine striking for higher pay? Or ganging up with machines in other shops and industries to force owner concessions? Or threatening to unseat Congressmen for failure to vote the "machine line"?

Construction Steel Awards

Fabricated steel awards this week included the following:

- 1000 Tons, Ithaca, N. Y., new agricultural library, Cornell University to Bethlehem Steel Co., Bethlehem, John W. Copper Co., Inc., Buffalo, general contractor.
- 450 Tons, Two Rivers, Wis., manufacturing building for the Hamilton Mfg. Co., to J. T. Ryerson and Sons, Chicago.
- 350 Tons, Canterbury and Plainfield, Conn., twin span reinforced concrete slab bridge, Campanelli-Cardi Construction Co., Hills-grove, R. I., low bidder.
- 285 Tons, Boston, Nut Island in Boston Harbor, building for City of Boston through Thomas O'Connor and Co., Cambridge, Mass., to Giroiser and Shlager Iron Works, Somerville, Mass.
- 265 Tons, Boston, new Boston Museum of Science through George B. H. Macomber Co., Boston, to Albert O. Wilson Structural Steel Co., Cambridge, Mass.
- 180 Tons, Chicago, building for Agar Packing Co., to J. T. Ryerson and Sons, Chicago.
- 125 Tons, Oak Park, Ill., Woolworth store building to Mississippi Valley Structural Steel Co., Chicago.
- 100 Tons, Tonawanda, N. Y., Sheridan Plaza shopping center, to R. S. McMannus Steel Construction Co., Buffalo.

Fabricated steel inquiries this week included the following:

- 1300 Tons, Marshalltown, Iowa, Center St. over-head bridge.
- 1200 Tons, Ft. Wayne, Ind., store building for Krenge Co.
- 125 Tons, Monroe County, Pa., bridge, Pennsylvania Dept. of Highways, due Oct. 28.

Reinforcing bar awards this week included the following:

- 1000 Tons, Omaha, Neb., sewer through Santucci Construction Co., Chicago, to U. S. Steel Supply Corp., Chicago.
- 940 Tons, Chicago, substructure Wacker Drive extension through Hurlbily Midcontinent Co., Chicago, to J. T. Ryerson and Sons Co., Chicago.
- 550 Tons, Chicago, substructure for Greyhound bus depot through Hurlbily Midcontinent Co., Chicago, to J. T. Ryerson and Sons Co., Chicago.
- 500 Tons, Missoula, Mont., St. Patrick's Hospital, through J. C. Boespling Construction Co., to Northwest Steel Rolling Mills, Inc., Seattle.
- 400 Tons, Chicago, C B & Q R.R. freight house to Wendnagel and Sons Co., Chicago.
- 385 Tons, Elyria, Ohio, sewer to Builders Structural Steel Co., Cleveland.
- 350 Tons, Ithaca, N. Y., new agricultural library, Cornell University, to Buffalo Steel Co., Buffalo.
- 175 Tons, Lincoln, Ill., power plant for state school to Laclede Steel Co., St. Louis.
- 140 Tons, Ravenna, Ohio, Ohio state highway project No. 687 to Truscon Steel Co., Youngstown, Ohio.
- 150 Tons, Seattle, University of Washington grade separation, through Henrick Valle Construction Co., to Northwest Steel Rolling Mills, Inc., Seattle.

Reinforcing bar inquiries this week included the following:

- 1200 Tons, Chicago, research hospital.
- 440 Tons, Bedford Park, Ill., water works system.
- 195 Tons, Elgin, Ill., Sherman Hospital building.
- 195 Tons, Rockford, Ill., sewage treating plant.
- 170 Tons, Chicago, Michael Reese Hospital tunnel.
- 115 Tons, Columbus, Ohio, building for the Farm Bureau Cooperative Assn.
- 110 Tons, Cleveland, produce warehouse.
- 105 Tons, Lafayette, Ind., Agricultural and Chemical bldg. for Purdue University.

Steel piling awards this week included the following:

- 105 Tons, Canterbury and Plainfield, Conn., twin span reinforced concrete slab bridge, Campanelli-Cardi Construction Co., Hills-grove, R. I., low bidder.

MARKET

IRON AGE
FOUNDED 1855
MARKETS & PRICES

Briefs and Bulletins

foreign offers—As a result of the steel strike and resultant steel shortage export and import houses are quoting foreign steel prices. Shortly there will be offered in the Midwest area Japanese sheets quoted f.o.b. Kobe. One thousand ton lots of 24 gage, 36 by 96 sheets have been quoted to a Chicago import house as follows: Hot-rolled annealed sheets \$154.00 a metric ton, hand dipped galvanized sheets \$195.00 a metric ton and cold-rolled sheets \$172.00 a metric ton. Delivery is promised for November and December. A metric ton is 2205 lb.

another look—Dr. Carroll R. Daugherty, chairman of the steel industry fact-finding board, says that if both the industry and the United Steelworkers of America were to make a request, the board might be willing to go back into session for the purpose of "clarifying" its recommendations. The steel strike resulted from failure of the industry and the union to agree on the pension-insurance phase of the report.

on blast—After being shut down for 5 months the Tonawanda Iron Div. blast furnace, controlled by American Radiator & Standard Corp. has been relighted. In addition to supplying iron for the parent firm, a company spokesman declared that some iron would be available for outside merchant iron trade.

strikes reach out—For a second week, ending Oct. 8, secondary unemployment because of strikes in the coal and steel industries rose rapidly, Bureau of Labor Statistics reports. New claims for unemployment compensation filed during the week amounted to 63,800, making a total of 309,000 since Sept. 24.

agreement—Armco Employee Independent Federation has reached an agreement on a contributory social insurance program and pension plan with Armco Steel Corp. Total cost of insurance is about 7¢ per hr. Pensions will range from \$100.00 to \$250.00 per month, including social security.

pittsburgh business—Business activity in Pittsburgh district last week was at 66.1 pct of the 1935-39 average. This compares with 145.8 pct in the week ended Sept. 24, the week before the start of the steel strike, according to the Bureau of Business Research, University of Pittsburgh.

ore shipments—Lake iron ore shipments have fallen behind the tonnage moved last year. The cumulative total of ore hauled so far this year is 68,133,373 tons, compared with 70,707,682 tons last season.

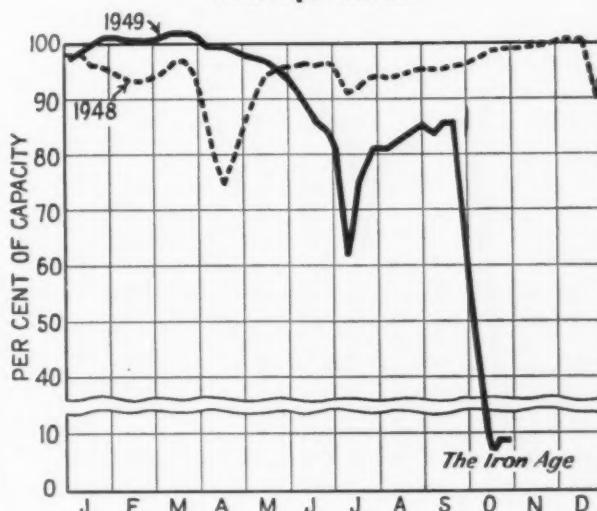
U. S. Steel earnings—U. S. Steel Corp. reported net income for the third quarter of 1949 of \$39,171,144.00 as compared with \$44,123,595.00 for the second quarter of 1949. Income for the first nine months of 1949 was \$133,233,409.00 as compared with net income of \$88,042,150.00 for the first nine months of 1948. Operating rate for the corporation during the third quarter of 1949 averaged 82.7 pct of rated capacity against 99.8 pct during the second quarter.

auto outlook—Past history indicates that the auto industry will do two things during a steel strike: It will tend to produce cars as long as it has steel and it will tend to exaggerate the time required to get back into production after shutting down. Auto executives are pushing their steel stocks to the limit this time to give their dealers something to sell between now and Christmas.

price war—The quiet price war in No. 2 foundry iron going on for the past month or so in the Southwest may end in November. So far reductions have averaged \$1.00 to \$3.00 a ton. Late reports indicate prices are firming.

back to work—The United Steelworkers announced Monday that the Parkersburg Steel Co., Parkersburg, W. Va., has agreed to the union demands on pensions and social insurance, thus ending the strike at that plant.

Steel Operations



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
October 16	3.5	5.0*	.....	7.0	.....	.....	85.0	.....	22.5*	24.0	40.5	84.5	42.5	9.5
October 23	3.5	5.0	.....	7.0	.....	.....	65.0	.....	23.0	23.5	36.5	78.0	35.0	9.5

* Revised.

Nonferrous METALS OUTLOOK

Market Activities



by

John Anthony

London Metal Exchange to be reopened for trading in tin
... RFC reduces tin to 95¢ ... Brass and bronze ingot makers
raise prices ½¢ to ¾¢ per lb.

New York—The British Ministry of Supply has announced that the London Metal Exchange would be reopened for trading in tin on Nov. 15. Observers feel that this step may result in some downward price movement in the tin market.

Various estimates place the stabilization level of the market at 75¢ to 85¢ per lb. Some traders believe that the UK may establish restrictions on the free operation of the Exchange so as to prevent rapid price reductions which would cost the country dollar exchange.

RFC Brings Down Tin Price

RFC announced on Monday the reduction of its price for Grade A tin is 95¢, the same as for British Ministry tin for future delivery. The usual differentials for grade will apply.

The domestic tin market is quite inactive now that the steel strike is under way. But without a differential in the spot and futures prices, there is no incentive to consumers to place orders for futures. RFC states that the price was lowered because they weren't selling any tin. But skeptics in the

NONFERROUS METALS PRICES

	Oct. 19	Oct. 20	Oct. 21	Oct. 22	Oct. 24	Oct. 25
Copper, electro, Conn.	17.625	17.625	17.625	17.625	17.625	17.625
Copper, Lake, Conn.	17.75	17.75	17.75	17.75	17.75	17.75
Tin, Grade A, New York ...	95.75	95.75	95.75	95.75	95.00	95.50
Zinc, East St. Louis	9.25	9.25	9.25	9.25	9.25	9.25
Lead, St. Louis	12.80	12.80	12.80	12.80	12.80	12.80

Note: Quotations are going prices.

trade point to the ore buying contracts tied to the tin market.

Scrap Ingot Prices Higher

Brass and bronze ingot makers raised their prices last week and early this week by ½¢ to ¾¢ per lb. This development reflects the growing strength of the copper and brass scrap market. Both refiners and ingot makers were offering higher prices this week. Ingot makers say there has been no major pick-up in demand. But the fact that they have had to raise their scrap buying prices indicates some improvement in the market.

The copper statistics of the fab-

ricators for September as reported in the trade confirm the tremendous change from spring and summer business previously reported. Most significant was the new business booked by fabricators in September. This amounted to 106,000 tons, in terms of copper content, as compared with not quite 67,000 tons in August.

Consumption of copper by fabricators in September totaled 114,760 tons, the highest month since last October. This figure represents an increase in consumption by fabricators of 26,700 tons. During the month industry stocks of copper dropped by about 35,000 tons.

MARKETS—PRICES—TRENDS



SCRAP

Iron & Steel

Market Trend Mixed; Dealers Reluctant to Sell

The market undertone was uncertain this week as the top quotation of No. 1 heavy melting was off \$2.00 in Philadelphia, Cleveland and Youngstown; in Pittsburgh and Buffalo it was off \$1.00. There is no doubt that some factors in the trade expect prices to rise as soon as the steel strike is settled. Some dealers are accumulating scrap and have not shown any inclination to compete for tonnages that the mills are willing to buy. In the Canadian scrap market prices on all steelmaking grades advanced \$4.00 to former ceiling levels. This week THE IRON AGE scrap composite is off another 92¢ to \$25.58 per gross ton.

PITTSBURGH — No. 1 heavy melting steel dropped off \$1.00 to a top of \$29.00 this week on the basis of sales of considerable tonnage to a large steel producer. This confirmed the weakness that was in the making last week. Brokers were holding firm against bids at lower prices, but some were conceding that continuation of the strike will develop further weakness.

CHICAGO — Scrap prices remained firm here. A few isolated mill purchases for shipment after the strike is over were again made at \$28.00 for No. 1 heavy melting. This is mostly earmarked scrap and is not representative of the market. However, traders here believe this price is

much more indicative of the post-strike market than are present distressed prices. It appears the trade expects at least a \$30.00 No. 1 heavy melting price when the mills start again.

PHILADELPHIA — Steel grades dropped \$2.00 to \$2.50 a ton here. There was an increased spread between No. 1 and other heavy melting grades. No. 2 bundles were not being bought. Turnings grades were down. There is no longer a market here for borings and turnings. Rail specialties were sold at higher prices. Cast prices are unchanged from last week. Dealers are still choosing to sit back with their inventories rather than to compete on a price basis for the available tonnage.

NEW YORK — The market undertone remains strong here as the steel strike entered its fourth week. Prices are firm and substantially unchanged from last week. There is some mill and foundry business, but the tonnages involved are so small that it cannot be considered as a factor in influencing the market. Dealers are laying down material and have no intentions of selling it at today's prices.

DETROIT — The local scrap market remains quiet and firm but with great possibilities for an explosion when the steel strike is finally ended. Local estimates place the volume of industrial scrap that will be available in November at less than 50 pct maximum of the October volume. This may intensify the scramble for scrap at close of or even before the present stalemate is ended. While some dealers are apparently looking quietly for a chance to liquidate some of their present holdings, most factors are hanging on despite continuing pressure on their pocketbooks and storage facilities.

CLEVELAND — Prices were down sympathetically here and in the Valley. Brokers and yard operators continued to lay down material and are taking the position that the industrial lists which close this week will show the strength of the market substantially unchanged from last month. Supporting this is the absence thus far of any appreciable tonnage of distressed scrap, all of which would seem to point up the prediction that a very strong market will greet the mills when the strike is over.

BOSTON — The current strike situation has affected the market here to the extent that there is little business and no price changes. No. 1 steel remains at \$17.00—\$18.00 which is very near its top price of the current move. Cast is likewise moving slowly.

BUFFALO — With leading dealers cutting yard prices, consumer ranges on scrap prices were lowered 75¢ to \$1.00 a ton here. While the declines were considered nominal, dealers agreed that the market had eased in view of the prolonged steel strike. Also tending to ease the market was the fact that dealers had unloaded material loaded into freight cars for post-strike delivery. This action was taken to avoid demurrage charges.

CINCINNATI — Prices were unchanged here as scrap continued to move to consumers in other districts and to the two district mills that are operating. Movement of material to remote districts has not weakened the local market, which is strong, particularly blast furnace and No. 2 bundles. Higher prices have not developed locally because there is relatively little competition for the available tonnage, which is considerable.

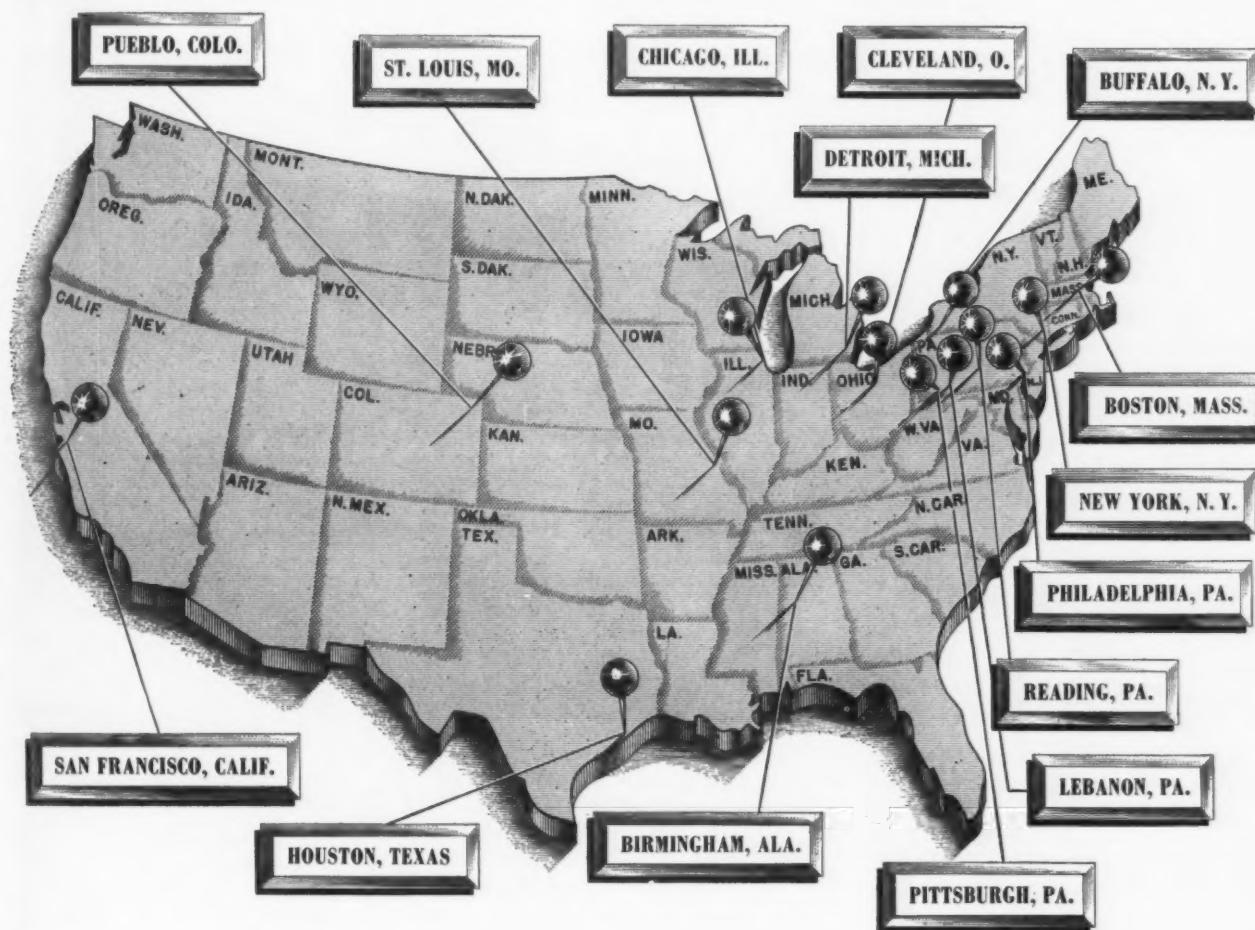
BIRMINGHAM — Some dealers in this area are stockpiling and a considerable amount of speculative buying is reported. Mills are making no purchases of open-hearth grades, however, and consumer demand is being shown for nothing except cast iron grades and rerolling rails. No material is moving from Birmingham to out of district points.

ST. LOUIS — Shipments of scrap iron are holding up well except from points along the Missouri Pacific whose 44-day strike was settled on Monday. The settlement will release 3000 to 4000 tons which the company has sold and was holding. Offerings of scrap made surplus by the steel strike elsewhere have not been large enough so far to affect the market.

TORONTO — Scrap supply in Canada has tightened and dealers have advanced prices on all steel grades to former ceiling levels, a mark up of \$4.00 per gross ton, while cast scrap has been jumped to \$40.00—\$43.00 per gross ton, the latter grade not being under ceiling control. Dealers credit the quick jump to the fact that the big consumers have entered the market for large quantities of scrap, whereas when the price broke several months ago they were all out of the market at the same time. Cast scrap is somewhat tighter than steel grades and dealers report some difficulty in meeting all demands. Scrap imports from the United States are prohibited except under special license and little or no scrap now is reaching Canada from the U. S.

*For the Purchase or Sale of
Iron and Steel Scrap...*

CONSULT OUR NEAREST OFFICE



The energy and integrity of our organization is ready to serve your best interests...
Since 1889, Luria Brothers & Company, Inc. have made fair dealings their constant aim.

CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP

LURIA BROTHERS AND COMPANY, INC.

Main Office

LINCOLN-LIBERTY BLDG.
Philadelphia 7, Pennsylvania

Yards

LEBANON, PA. • READING, PA.
DETROIT (ECORSE), MICH.
MODENA, PA. • PITTSBURGH, PA.
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BIRMINGHAM, ALA.
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ST. LOUIS, MO.
2110 Railway Exchange Bldg.

CHICAGO, ILL.
100 W. Monroe St.

CLEVELAND, O.
1022 Midland Bldg.

DETROIT, MICH.
2011 Book Bldg.

HOUSTON, TEXAS
803-4-5 Milam Bldg.

LEBANON, PA.
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NEW YORK, N.Y.
Woolworth Bldg.

PITTSBURGH, PA.
Oliver Bldg.

PUEBLO, COLO.
334 Colorado Bldg.

READING, PA.
Luria Bldg.

SAN FRANCISCO, CAL.
Pacific Gas & Elec. Co., Bldg.

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Pittsburgh

No. 1 hvy. melting	\$23.50 to \$29.00
No. 2 hvy. melting	26.50 to 27.00
No. 1 bundles	28.50 to 29.00
No. 2 bundles	23.50 to 24.00
Machine shop turn.	20.50 to 21.00
Mixed bor. and ms. turn.	20.50 to 21.00
Shoveling turnings	22.00 to 22.50
Cast iron borings	21.00 to 21.50
Low phos. plate	32.00 to 32.50
Heavy turnings	24.00 to 25.00
No. 1 RR. hvy. melting	29.50 to 30.00
Scrap rails, random lgth.	34.00 to 35.00
Rails 2 ft and under	33.00 to 39.00
RR. steel wheels	33.00 to 34.00
RR. spring steel	33.00 to 34.00
RR. couplers and knuckles	33.00 to 34.00
No. 1 machinery cast	39.00 to 40.00
Mixed yard cast	36.00 to 37.00
Heavy breakable cast	29.00 to 30.00
Malleable	32.00 to 33.00

Chicago

No. 1 hvy. melting	\$25.00 to \$26.00
No. 2 hvy. melting	23.00 to 24.00
No. 1 factory bundles	25.00 to 26.00
No. 1 dealers' bundles	21.00 to 22.00
No. 2 dealers' bundles	19.00 to 20.00
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	17.00 to 18.00
Low phos. forge crops	33.00 to 34.00
Low phos. plate	30.00 to 31.00
No. 1 RR. hvy. melting	31.00 to 32.00
Scrap rails, random lgth.	38.00 to 39.00
Rerolling rails	43.00 to 44.00
Rails 2 ft and under	42.00 to 43.00
Locomotive tires, cut	39.00 to 40.00
Cut bolsters & side frames	33.00 to 35.00
Angles and splice bars	35.00 to 36.00
RR. steel car axles	44.00 to 45.00
No. 3 steel wheels	22.50 to 33.50
RR. couplers and knuckles	34.00 to 35.00
No. 1 machinery cast	41.00 to 43.00
No. 1 agricul. cast	40.00 to 41.00
Heavy breakable cast	32.00 to 34.00
RR. grate bars	30.00 to 31.00
Cast iron brake shoes	30.00 to 31.00
Cast iron car wheels	32.00 to 34.00
Malleable	36.00 to 37.00

Philadelphia

No. 1 hvy. melting	\$22.00 to \$23.00
No. 2 hvy. melting	20.50 to 21.50
No. 1 bundles	21.50 to 22.50
No. 2 bundles	19.50 to 20.50
Machine shop turn.	15.50 to 16.50
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	16.50 to 17.50
Low phos. punchings, plate	26.00 to 26.50
Low phos. 5 ft and under	25.00 to 26.00
Low phos. bundles	25.00 to 25.50
Hvy. axle forge turn.	24.00 to 25.00
Clean cast chem. borings	26.00 to 27.00
RR. steel wheels	28.00 to 28.50
RR. spring steel	28.00 to 28.50
No. 1 machinery cast	35.00 to 36.00
Mixed yard cast	32.00 to 33.00
Heavy breakable cast	32.00 to 33.00
Cast iron carwheels	34.00 to 35.00
Malleable	34.00 to 35.00

Cleveland

No. 1 hvy. melting	\$24.50 to \$25.00
No. 2 hvy. melting	22.00 to 22.50
No. 1 busheling	24.50 to 25.00
No. 1 bundles	24.50 to 25.00
No. 2 bundles	17.50 to 18.00
Machine shop turn.	14.00 to 14.50
Mixed bor. and turn.	15.50 to 16.00
Shoveling turnings	15.50 to 16.00
Cast iron borings	15.50 to 16.00
Low phos. 2 ft and under	26.00 to 26.50
Steel axle turn.	24.50 to 25.00
Drop forge flashings	24.50 to 25.00
No. 1 RR. hvy. melting	32.00 to 33.00
Rails 3 ft and under	40.00 to 41.00
Rails 18 in. and under	41.00 to 42.00
No. 1 machinery cast	43.00 to 44.00
RR. cast.	43.00 to 44.00
RR. grate bars	32.00 to 33.00
Stove plate	36.00 to 37.00
Malleable	38.00 to 39.00

Youngstown

No. 1 hvy. melting	\$28.50 to \$29.00
No. 2 hvy. melting	26.00 to 26.50
No. 1 bundles	28.50 to 29.00

Scrap IRON & STEEL Prices

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

No. 2 bundles	\$20.00 to \$20.50
Machine shop turn.	14.50 to 15.00
Shoveling turnings	17.50 to 18.00
Cast iron borings	17.50 to 18.00
Low phos. plate	29.50 to 30.00

Buffalo

No. 1 hvy. melting	\$27.00 to \$27.50
No. 2 hvy. melting	24.50 to 25.00
No. 1 busheling	24.50 to 25.00
No. 1 bundles	25.50 to 26.00
No. 2 bundles	23.00 to 23.50
Machine shop turn.	18.00 to 18.50
Mixed bor. and turn.	19.00 to 19.50
Shoveling turnings	21.50 to 22.00
Cast iron borings	19.00 to 19.50
Low phos. plate	29.00 to 29.50
Scrap rails, random lgth.	33.50 to 34.00
Rails 2 ft and under	37.50 to 38.00
RR. steel wheels	33.50 to 34.00
RR. spring steel	33.50 to 34.00
RR. couplers and knuckles	33.50 to 34.00
No. 1 cupola cast	37.00 to 37.50
Mixed yard cast	35.50 to 36.00
Stove plate	35.00 to 35.50
Small indus. malleable	24.00 to 24.50

Birmingham

No. 1 hvy. melting	\$25.00
No. 2 hvy. melting	24.00
No. 2 bundles	22.00
No. 1 busheling	24.00
Machine shop turn.	\$16.00 to 17.00
Shoveling turnings	19.00
Cast iron borings	18.00
Bar crops and plate	29.00 to 30.00
Structural and plate	29.00 to 30.00
No. 1 RR. hvy. melt.	28.00 to 28.50
Scrap rails, random lgth.	29.00 to 30.00
Rerolling rails	36.00 to 37.00
Rails 2 ft and under	34.00 to 35.00
Angles & splice bars	32.00 to 33.00
Std. steel axles	28.00 to 29.00
No. 1 cupola cast	34.00 to 35.00
Stove plate	28.00
Cast iron carwheels	23.00 to 24.00

St. Louis

No. 1 hvy. melting	\$27.00 to \$28.00
No. 2 hvy. melting	25.00 to 26.00
No. 2 bundled sheets	25.00 to 26.00
Machine shop turn.	19.00 to 20.00
Shoveling turnings	19.00 to 20.00
Rails, random lengths	31.00 to 32.00
Rails 3 ft and under	33.00 to 34.00
Locomotive tires, uncut	27.00 to 28.00
Angles and splice bars	33.00 to 34.00
Std. steel car axles	35.00 to 37.00
RR. spring steel	29.00 to 30.00
No. 1 machinery cast	36.00 to 38.00
Hvy. breakable cast	31.00 to 32.00
Cast iron brake shoes	31.00 to 32.00
Stove plate	33.00 to 35.00
Cast iron car wheels	34.00 to 35.00
Malleable	30.00 to 32.00

New York

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	\$18.50 to \$19.00
No. 2 hvy. melting	17.00 to 18.00
No. 2 bundles	15.00 to 16.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	10.00 to 11.00
Shoveling turnings	11.00 to 12.00
Clean cast chem. bor.	20.50 to 21.50
No. 1 machinery cast	30.00 to 32.00
Mixed yard cast	29.00 to 30.00
Charging box cast	26.00 to 27.00
Heavy breakable cast	26.00 to 27.00
Unstrp. motor blocks	25.00 to 26.00

Boston

No. 1 hvy. melting	\$17.00 to 18.00
No. 2 hvy. melting	15.00 to 16.00
No. 1 bundles	17.00 to 18.00
Machine shop turn.	11.00 to 12.00
Mixed bor. and turn.	11.00 to 12.00
Shoveling turnings	15.50 to 16.50
Clean cast chem. bor.	15.50 to 16.50
No. 1 machinery cast	32.00 to 33.00
Mixed yard cast	31.00 to 32.00
Charging box cast	28.00 to 29.00
Heavy breakable cast	26.00 to 27.00
Unstrp. motor blocks	25.00 to 26.00

No. 2 bundles	\$15.00 to \$16.00
Machine shop turn.	9.50 to 10.00
Mixed bor. and turn.	9.00 to 9.50
Shoveling turnings	10.50 to 11.00
No. 2 busheling	11.00 to 12.00
Clean cast chem. borings	15.50 to 16.50
No. 1 machinery cast	32.00 to 34.00
No. 2 machinery cast	28.00 to 29.00
Heavy breakable cast	25.00 to 26.00
Stove plate	25.00 to 26.00

Detroit

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$17.00 to \$18.00
No. 2 hvy. melting	15.00 to 16.00
No. 1 bundles	19.00 to 20.00
New busheling	17.00 to 18.00
Flashings	17.00 to 18.00
Machine shop turn.	11.00 to 12.00
Mixed bor. and turn.	11.00 to 12.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	13.00 to 14.00
Low phos. plate	17.00 to 18.00
No. 1 cupola cast	33.00 to 34.00
Heavy breakable cast	27.00 to 29.00
Stove plate	26.00 to 27.00
Automotive cast	33.00 to 34.00

Cincinnati

Per gross ton, f.o.b. cars:	
No. 1 hvy. melting	\$25.50 to \$26.00
No. 2 hvy. melting	21.50 to 22.00
No. 1 bundles	25.50 to 26.00
No. 2 bundles	19.50 to 20.00
Machine shop turn.	12.50 to 13.00
Mixed bor. and turn.	12.50 to 13.00
Shoveling turnings	15.50 to 16.00
Cast iron borings	14.50 to 15.00
Low phos. 18 in. under	34.00 to 35.00
Rails, random lengths	34.00 to 35.00
Rails, 18 in. and under	44.00 to 45.00
No. 1 cupola cast	40.00 to 41.00
Hvy. breakable cast	34.00 to 35.00
Drop broken cast	43.00 to 44.00

San Francisco

No. 1 hvy. melting	\$20.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Machine shop turn.	9.00
Elec. fur. 1 ft and under	28.00
No. 1 RR. hvy. melting	17.00
Scrap rails, random lgth.	17.00
No. 1 cupola cast	30.00

Los Angeles

No. 1 hvy. melting	\$10.00

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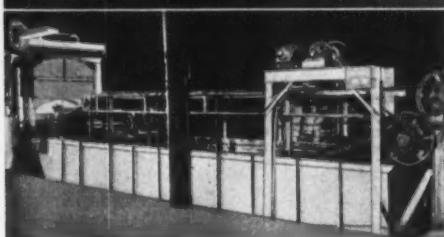
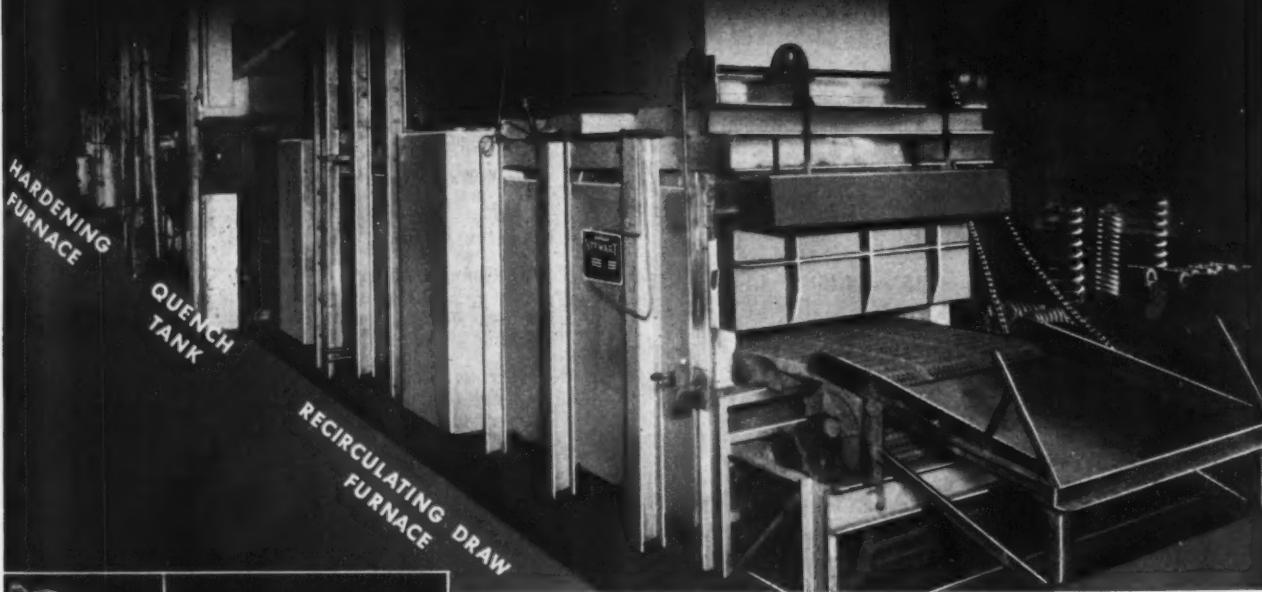
No. 97
of a
Series
of Typical
Installations

Sunbeam STEWART

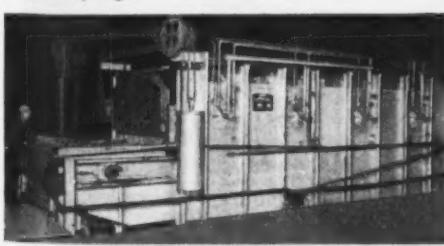
THE BEST INDUSTRIAL FURNACES MADE

HEAT TREATING RAILWAY AND INDUSTRIAL SPRINGS

At AMERICAN-FORT PITT SPRING DIV., MCKEES ROCKS, PA.



An exclusive double belt conveys springs through the quenching oil. This design eliminates impact, permits an even quench along the longitudinal axis of the spring.



Overall dimensions of the Hardening Furnace are 11 1/2' by 30 1/2', with a usable hearth space of 54" by 25'.

Overall view of the integrated Sunbeam Stewart Harden, Quench and Draw heat treating line (approximately 100 ft. long) for helical springs. This installation is capable of handling 3,500 lbs. per hour.

This is Number 97 in a series of typical installations showing how Sunbeam Stewart Furnaces are helping manufacturers reduce costs and keep themselves competitive. These installations also demonstrate the wide variety of specific requirements in the metal-working industry Sunbeam Stewart Furnaces are designed to meet.

Springs manufactured by American-Fort Pitt Spring Division of the H. K. Porter Co., Inc., are such as those used in the agricultural implement and railroad fields, with a monthly production of about 700 to 800 tons.

To eliminate distortion of springs due to shock and impact, a double belt conveyor automatically delivers springs from the Hardening Furnace through the quench tank to the Draw Furnace. The upper belt runs slack so that its weight holds the spring firmly until quenched.

It will pay to consult Sunbeam Stewart on your heat treating problems. In addition to continuous conveyor units, Sunbeam Stewart builds a full line of standard furnaces and galvanizing equipment.

SUNBEAM STEWART INDUSTRIAL FURNACE DIVISION of SUNBEAM CORPORATION

(Formerly CHICAGO FLEXIBLE SHAFT CO.)

Main Office: Dept. 110, 4433 Ogden Ave., Chicago 23 — New York Office: 322 W. 48th St. New York 19 — Detroit Office: 3049 E. Grand Blvd., Detroit
Canada Factory: 321 Weston Rd., So., Toronto 9

A letter, wire or 'phone call will promptly bring you information and details on SUNBEAM STEWART furnaces, either units for which plans are now ready or units especially designed to meet your needs. Or, if you prefer, a SUNBEAM STEWART engineer will be glad to call and discuss your heat treating problems with you.

Comparison of Prices

Steel prices on this page are the average of various t.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel:	Oct. 25,	Oct. 18,	Sept. 27,	Oct. 26,
(cents per pound)	1949	1949	1949	1948
Hot-rolled sheets	3.25	3.25	3.25	3.26
Cold-rolled sheets	4.00	4.00	4.00	4.00
Galvanized sheets (10 ga)	4.40	4.40	4.40	4.40
Hot-rolled strip	3.25	3.25	3.25	3.265
Cold-rolled strip	4.038	4.038	4.038	4.063
Plates	3.40	3.40	3.40	3.42
Plates wrought iron....	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	33.00	33.00	33.00	33.25

Tin and Terneplate:

(dollars per base box)				
Tinplate (1.50 lb) cokes..	\$7.75	\$7.75	\$7.75	\$6.80
Tinplate, electro (0.50 lb)	6.70	6.70	6.70	6.00
Special coated mfg. ternes	6.65	6.65	6.65	5.90

Bars and Shapes:

(cents per pound)				
Merchant bars	3.35	3.35	3.35	3.37
Cold-finished bars	3.995	3.995	3.995	3.995
Alloy bars	3.75	3.75	3.75	3.75
Structural shapes	3.25	3.25	3.25	3.25
Stainless bars (No. 302)	28.50	28.50	28.50	28.50
Wrought iron bars....	9.50	9.50	9.50	9.50

Wire:

(cents per pound)				
Bright wire	4.15	4.15	4.15	4.256

Rails:

(dollars per 100 lb)				
Heavy rails	\$3.20	\$3.20	\$3.20	\$3.20
Light rails	3.55	3.55	3.55	3.55

Semifinished Steel:

(dollars per net ton)				
Rerolling billets	\$52.00	\$52.00	\$52.00	\$52.00
Slabs, rerolling	52.00	52.00	52.00	52.00
Forging billets	61.00	61.00	61.00	61.00
Alloy blooms, billets, slabs	63.00	63.00	63.00	63.00

Wire rod and Skelp:

(cents per pound)				
Wire rods	3.40	3.40	3.40	3.619
Skelp	3.25	3.25	3.25	3.25

Composite Prices

Finished Steel Base Price

Oct. 25, 1949.....	3.705¢ per lb.....
One week ago.....	3.705¢ per lb.....
One month ago.....	3.705¢ per lb.....
One year ago.....	3.720¢ per lb.....

High

1949....	3.720¢	Jan. 1	3.705¢	May 3
1948....	3.721¢	July 27	3.193¢	Jan. 1
1947....	3.193¢	July 29	2.848¢	Jan. 1
1946....	2.848¢	Dec. 31	2.464¢	Jan. 1
1945....	2.464¢	May 29	2.396¢	Jan. 1
1944....	2.396¢		2.396¢	
1943....	2.396¢		2.396¢	
1942....	2.396¢		2.396¢	
1941....	2.396¢		2.396¢	
1940....	2.30467¢	Jan. 2	2.24107¢	Apr. 16
1939....	2.25367¢	Jan. 3	2.26689¢	May 16
1938....	2.58414¢	Jan. 4	2.27207¢	Oct. 18
1937....	2.58414¢	Mar. 9	2.32263¢	Jan. 4
1936....	2.32263¢	Dec. 28	2.05200¢	Mar. 10
1935....	2.07642¢	Oct. 1	2.06492¢	Jan. 8
1934....	2.15367¢	Apr. 24	1.95757¢	Jan. 2
1933....	1.95578¢	Oct. 3	1.75836¢	May 2
1932....	1.89196¢	July 5	1.83901¢	Mar. 1
1931....	1.99626¢	Jan. 13	1.86586¢	Dec. 29
1929....	2.31773¢	May 28	2.26498¢	Oct. 29

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Price advances over previous week are printed in Heavy Type; declines appear in Italics.

Pig Iron:	Oct. 25,	Oct. 18,	Sept. 27,	Oct. 26,
(per gross ton)	1949	1949	1949	1948
No. 2, foundry, Phila.....	\$50.42	\$50.42	\$50.42	\$51.56
No. 2, Valley furnace.....	46.50	46.50	46.50	46.50
No. 2, Southern Cin'ti.....	46.08	46.08	46.08	49.47
No. 2, Birmingham.....	39.38	39.38	39.38	43.38
No. 2, foundry, Chicago†	46.50	46.50	46.50	46.50
Basic del'd Philadelphia.....	49.92	49.92	49.92	50.76
Basic, Valley furnace.....	46.00	46.00	46.00	46.00
Malleable, Chicago†.....	46.50	46.50	46.50	46.50
Malleable, Valley.....	46.50	46.50	46.50	46.50
Charcoal, Chicago.....	68.56	68.56	68.56	73.78
Fermomanganese†.....	173.40	173.40	173.40	161.71

The switching charge for delivery to foundries in the Chicago district is \$1 per ton.

†Average of U. S. prices quoted on Ferroalloy page.

Scrap:

Scrap:	(per gross ton)			
Heavy melt'g steel, P'gh..	\$28.75	\$29.50	\$29.75	\$42.75
Heavy melt'g steel, Phila.	22.50	24.50	25.50	45.00
Heavy melt'g steel, Ch'go	25.50	25.50	28.50	41.75
No. 1 hy. comp. sh't Det..	19.50	19.50	23.50	38.00
Low phos. Young'n.....	29.75	31.75	31.75	47.75
No. 1, cast, Pittsburgh.....	39.50	39.50	39.50	70.00
No. 1, cast, Philadelphia.....	35.50	35.50	39.00	66.50
No. 1, cast, Chicago.....	42.00	42.00	42.50	71.00

Coke: Connellsville:

Coke: Connellsville:	(per net ton at oven)			
Furnace coke, prompt....	\$14.25	\$14.25	\$14.25	\$15.00
Foundry coke, prompt....	15.75	15.75	15.75	17.00

Nonferrous Metals:

Nonferrous Metals:	(cents per pound to large buyers)			
Copper, electro, Conn....	17.625	17.625	17.625	23.50
Copper, Lake Conn.....	17.75	17.75	17.75	23.625
Tin Straits, New York....	95.00	95.75	95.00	\$1.08
Zinc, East St. Louis.....	9.25	9.25	10.00	15.50
Lead, St. Louis.....	12.80	12.80	14.60	19.30
Aluminum, virgin.....	17.00	17.00	17.00	17.00
Nickel electrolytic.....	42.97	42.97	42.93	42.90
Magnesium, ingot.....	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex....	32.00	32.00	38.50	35.00

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

Pig Iron

....\$45.88 per gross ton....	....\$25.58 per gross ton....
....45.88 per gross ton....	....26.50 per gross ton....
....45.88 per gross ton....	....27.92 per gross ton....
....46.91 per gross ton....	....43.16 per gross ton....

Scrap Steel

....\$22.00 per gross ton....	....\$19.17 per gross ton....
....22.61 per Jan. 2	....21.83 Dec. 30
....20.61 Sept. 12	....14.08 May 16
....22.50 Oct. 3	....14.08 May 16

....22.45 Dec. 23	....21.92 Mar. 30
....23.25 June 21	....12.67 June 9
....23.25 Mar. 9	....11.00 June 1
....20.25 Feb. 16	....12.67 June 9

....19.74 Nov. 24	....17.75 Dec. 21
....18.73 Aug. 11	....12.67 June 9
....17.83 May 14	....10.33 Apr. 25
....16.90 Jan. 27	....13.00 Mar. 13

....16.90 Dec. 5	....12.25 Aug. 8
....13.56 Jan. 5	....8.50 Jan. 12
....13.56 Dec. 6	....6.43 July 1
....14.79 Dec. 15	....11.33 Jan. 6

....18.71 May 14	....17.58 Jan. 29
....18.21 Dec. 17	

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

Base Column
Pittsburgh,
Calif.

\$51.56	Standard & coated nails*	103	122
46.50	Woven wire fence†	109	132
49.47	Fence posts, carloads†	112	
43.38	Single loop bale ties	106	130
46.50	Galvanized barbed wire**	123	143
46.50	Twisted barbless wire	123	

50.76
46.00
46.50
46.50
73.78
161.71

* Pgh., Chi., Duluth; Worcester, 6 columns higher; Houston, 8 columns higher; Kansas City, 12 Columns higher. † 15½ gauge and heavier. ** On 80 rod spools, in carloads. †† Duluth, Joliet and Johnstown.

Base per Pittsburgh,
100 lb Calif.

Annealed fence wire†	\$4.80	\$5.75
Annealed, galv. fencing†	5.25	6.20
Cut nails, carloads†	6.75	

1 Add 30¢ at Worcester; 10¢ at Sparrows Pt.
45.00
41.75
41.75
38.00
47.75
70.00
66.50
71.00
\$42.75
45.00
41.75
38.00
47.75
70.00
66.50
71.00
\$15.00
17.00

† Less 20¢ to jobbers.

PRODUCING POINTS — Standard, coated or galvanized nails, woven wire fence, bale ties, and barbed wire: Alabama City, Ala., 4; Atlanta, 65; Alquippa, Pa. (except bale ties), 5; Bartonsville, Ill. (except bale ties), 34; Chicago, 6; Donora, Pa., 2; Duluth, 2; Fairfield, Ala., 11; Johnstown, Pa. (except bale ties), 3; Joliet, Ill., 2; Kokomo, Ind., 30; Minnequa, Colo., 14; Monessen, Pa. (except bale ties), 18; Pittsburgh, Calif., 24; Portsmouth, Ohio, 20; Rankin, Pa. (except bale ties), 2; Sparrows Point (except woven fence), 3; Sterling, Ill., 33; San Francisco (except nails and woven fence), 14; Torrance, Calif. (nails only), 24; Worcester (nails only), 2; Houston (except bale ties), 83; Kansas City (except bale ties), 33.

Fence posts: Duluth, 2; Johnstown, Pa., 3; Joliet, Ill., 2; Minnequa, Colo., 14; Moline, Ill., 4; Williamsport, Pa., 51.

Cut nails: Wheeling, W. Va., 15; Conshohocken, Pa., 26.

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa. (21)	..*	26.50
Washgtn, Pa. (39)	..*	26.50
Claymont, Del. (29)	..*	26.50
Conshohocken, Pa. (26)	..*	22.50
New Castle, Ind. (55)	..*	26.50
Nickel-carbon		24.00
10 pct, Coatesville, (26)		27.50
Inconel-carbon		
10 pct, Coatesville, (21)		36.00
Monel-carbon		
10 pct, Coatesville, (21)		29.00
No. 302 Stainless-copper-stainless, Carnegie, Pa. (41)		75.00
Aluminized steel sheets, hot dip, Butler, Pa., (7)....		7.75

* Includes annealing and pickling, or sandblasting.

ELECTRICAL SHEETS

24 gage, HR cut lengths, f.o.b. mill

Cents per lb

Armature	.....	5.45
Electrical	.....	5.95
Motor	.....	6.70
Dynamo	.....	7.50
Transformer 72	.....	8.05
Transformer 65	.....	8.60
Transformer 58	.....	9.30
Transformer 52	.....	10.10

PRODUCING POINTS — Beech Bottom, W. Va., 18; Brackenridge, Pa., 28; Folansbee, W. Va., 63; Granite City, Ill., 22; Indiana Harbor, Ind., 8; Mansfield, Ohio, 75; Niles, Ohio, 64, 76; Toronto, Ohio, 63; Vandergrift, Pa., 1; Warren, Ohio, 4; Zanesville, Ohio, 7.

Numbers after producing points correspond to steel producers.
See key on previous page.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts	Pct Off List
1/4 in. & smaller x 6 in. & shorter	35
9/16 & 5/8 in. x 6 in. & shorter	37
5/8 in. & larger x 6 in. shorter	34
All diam, longer than 6 in.	30
Lag, all diam over 6 in. & longer	35
Lag, all diam x 6 in. & shorter	37
Plow bolts	47

Nuts, Cold Punched or Hot Pressed (Hexagon or Square)

1/4 in. and smaller	35
9/16 to 1 in. inclusive	34
1/2 to 1 1/4 in. inclusive	32
1 1/4 in. and larger	27

On above bolts and nuts, excepting plow bolts, additional allowances of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifinished Hexagon Nuts

USS	SAE
7/16 in. and smaller	41
1/2 in. and smaller	38
1/2 in. through 1 in.	39
9/16 in. through 1 in.	37
1 1/4 in. through 1 1/2 in.	35
1 1/2 in. and larger	28

In full case lots, 15 pct additional discount.

Stove Bolts

Packages, nuts separate	\$61.75
In bulk	70.00

Large Rivets

(1/2 in. and larger)	Base per 100 lb
F.o.b. Pittsburgh, Cleveland, Chicago	\$6.75
F.o.b. Lebanon, Pa.	6.75

Small Rivets

(7/16 in. and smaller)	Pct off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	48

Cap and Set Screws

(In packages)	Pct Off List
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	46
% to 1 in. x 6 in., SAE (1035), heat treated	35
Milled studs	19
Flat head cap screws, listed sizes	5
Fillister head cap, listed sizes	28

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.00¢
0.41 to 0.60 carbon	5.50¢
0.61 to 0.80 carbon	6.10¢
0.81 to 1.05 carbon	8.05¢
1.06 to 1.35 carbon	10.35¢

Worcester, add 0.30¢.

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier,	
No. 1 quality, per 100 lb	\$3.20
Joint bars, per 100 lb	4.25

Light rails per 100 lb 3.55

Base Price

cents per lb

Track spikes	5.35
Axes	5.20
Screw spikes	8.00
Tie plates	4.05
Tie plates, Pittsburgh, Torr., Calif.	4.20
Track bolts, untreated	8.25
Track bolts, heat treated, to railroads	8.50
Seattle, add 30¢.	

PRODUCING POINTS—Standard rails: Bessemer, Pa., 1; Ensley, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Minnequa, Colo., 14; Steelton, Pa., 3.

Light rails: All the above except Indiana Harbor and Steelton, plus Fairfield, Ala., 11; Johnstown, Pa., 3; Minnequa, Colo., 14.

Joint bars: Bessemer, Pa., 1; Fairfield, Ala., 11; Indiana Harbor, Ind., 8; Joliet, Ill., 1; Lackawanna, N. Y., 3; Steelton, Pa., 3; Minnequa, Colo., 14.

Track spikes: Fairfield, Ala., 11; Indiana Harbor, Ind., 8; Lebanon, Pa., 3; McKees Rocks, Pa., 1.

Tie plates: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Pittsburgh, Calif., 24; Pittsburgh, 5;

Chicago, 4; Struthers, Ohio, 6; Youngstown, 4.

Track bolts: Fairfield, Ala., 11; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 77, 78.

Axes: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 79; Johnstown, Pa., 3.

Screw spikes: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lebanon, Pa., 3; McKees Rocks, Pa., 1.

Tie plates: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Pittsburgh, Calif., 24; Pittsburgh, 5; Seattie, 62; Steelton, Pa., 3; Torrance, Calif., 24; Minnequa, Colo., 14.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	90.5¢
18	4	2	—	5	\$1.025
1.5	4	2	1.5	8	65¢
6	4	2	6	—	69.5¢
					High-carbon-chromium
					Oil hardened manganese
					Special carbon
					Extra carbon
					Regular carbon
					Warehouse prices on and east of Mississippi are 2 1/4¢ per lb higher. West of Mississippi, 4 1/4¢ higher.

COKE

Furnace, beehive (f.o.b. oven) Net Ton Connellsville, Pa. \$14.00 to \$14.50 Foundry, beehive (f.o.b. oven) Connellsville, Pa. \$15.50 to \$16.00 Foundry, oven coke

Buffalo, del'd \$20.90 Chicago, f.o.b. 20.40 Detroit, f.o.b. 19.40 New England, del'd 22.70 Seaboard, N. J., f.o.b. 22.00 Philadelphia, f.o.b. 20.45 Sweden, Pa., f.o.b. 20.40 Plainesville, Ohio, f.o.b. 20.90 Erie, del'd \$20.25 to 21.04 Cleveland, del'd 22.62 Cincinnati, del'd 21.71 St. Paul, f.o.b. 23.50 St. Louis, del'd. 21.60 Birmingham, del'd 18.75

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill. Base price, per ton net: Effective CaF₂ content:

70% or more	\$37.00
60% or less	34.00

STEEL PRICES

Smaller numbers indicate producing companies. See key on facing page.
Base prices at producing points apply to the sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh, Weirton	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town	Warren	Detroit	Johns- town	Seattle, S. Frisco, Los Angeles	Fontana	
INGOTS Carbon forging, net ton	\$50.00											\$50.00				
Alloy, net ton	\$51.00							Houston 55.00 ^{b3}				\$51.00				
	1.17											1.17				
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	\$52.00	\$52.00	\$52.00		\$52.00	\$52.00	\$52.00	Conshohocken \$57.00 ^{b6}				\$52.00		\$71.00		
Carbon forging billets, net ton	\$51.00	\$61.00	\$61.00	\$61.00	\$61.00	\$61.00	\$61.00	Geneva \$61.00 ^{b6} Houston \$69.00 ^{b3}	\$61.00	\$61.00	\$61.00	\$61.00		\$30.00		
Alloy, net ton	\$63.00	\$63.00	\$63.00	Conshohocken \$65.00 ^{b6}	\$63.00	\$63.00	\$63.00	Bethlehem, ^a Canton, ^{a-4-2} Massillon ^a = \$63.00	\$61.00	\$61.00	\$61.00	\$61.00		\$92.00		
	1.17	1.4	1	1	3.4	3.4	3.4	1.17	2.8	2.8	2.8	2.8	1.17	1.17		
PIPE SKELP	3.25						3.25				3.25					
1.5							1.4				4					
WIRE RODS	3.40	3.40	3.40	3.40	3.40		3.40	3.50	Portsmouth 3.40 ^{b20} Hous'lon, 3.95 ^{b3}	Worcester 3.70 ^{b3}	3.40	4.05 ^{b4} S.F., L.A. 4.20 ^{b2} L.A.				
	2.18	2.4-33	2	2	4.11		6	3			8					
SHEETS Hot-rolled (16 ga. & hvr.)	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	Kokomo, ^{b10} Ashland ^{b7} = 3.25	3.25	3.45	Consh. 3.35 ^{b20}	3.85	4.15		
	1.5-9.15	23	1.6-8	4.5	4.11	3	1.6-13	3		4	12	24	L.A.	10		
Cold-rolled	4.00 ^{b1-5} 7.9-15.63	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.20	4.00	4.20	4.20	4.85	4.90		
Galvanized (10 gage)	4.40		4.40		4.40		Niles 4.40 ^{b6}	4.40	Canton 4.40 ^{b4}					5.15		
Enameling (12 gage)	4.40		4.40				4.40		Ashland 4.40 ^{b7}							
	1		1.8	4			6				12					
Long terne (10 gage)	4.80		4.80							4.80						
9.15		1								7						
Hi Str. Low Alloy, h.r.	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	Conshohocken 4.95 ^{b20}	4.95	5.15					
1.5-9	1	1.6-8	4.5	11	3	1.6-13	3		4	12						
Hi Str. Low Alloy, c.r.	6.05		6.05	6.05		6.05	6.05	6.05		6.05	6.25					
1.5		1.6-8	4.5			3	6.18	3		4	12					
Hi Str. Low Alloy, galv.	6.75			.75				6.75	Canton 6.75 ^{b4}							
1			4					3								
STRIP	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	Ashland 3.25 ^{b7} 3.65 ^{b3}	3.25	3.45	Atlanta 3.40 ^{b3}	4.00 ^{b2}	4.40		
Hot-rolled	5.7-9.28	23.06	1.6-8	8	11	3	1.6-13	3	4.00	4.00	12-47	S.F., L.A.	10			
Cold-rolled	4.00	4.15	4.00	4.00		4.00	4.00	4.00	New Haven 4.50 ^{b2-68}	4.00	4.20	12-47	4.25 ^{b2} S.	4.90		
	5.7-9.63	66	8	2.5		3	6.19- 40.48	3	7	4.25 ^{b2} S.						
Hi Str. Low Alloy, h.r.	4.95		4.95	4.95	4.95	4.95	4.95	4.95		4.95	5.15					
5		1.6-8	8	11	3	1.6-13	3		4	12						
Hi Str. Low Alloy, c.r.	6.05			6.05		6.05	6.05	6.05		6.05	6.25					
5.9			3.5			3	6.18	3		4	12					
TINPLATE^{b1} Cokes, 1.50 lb, base box	\$7.75		\$7.75		\$7.85			\$7.85	\$7.95		7.75			8.50		
	1.5-9.15	1.6-8		11				3	22	4	24	S.F.				
Electrolytic 0.25, 0.50, 0.75 lb. box																

Deduct \$1.30, \$1.05 and 75¢ respectively from 1.50 lb. coke base box price

BLACKPLATE, 29 ga. Hollowware enameling	5.30	5.30						5.40	5.50	5.30							
	1.5-15	1.6-8						3	22	4							
BARS Carbon Steel	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	Atlanta 3.50 ^{b5} 3.35 ^{b4}	3.75 ^{b3}	3.55	3.35	4.05 ^{b2} L.A. 4.05 ^{b4}	4.00			
Reinforcing ^{b1}	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	Atlanta 3.50 ^{b5} 3.35 ^{b4}	3.75 ^{b3}	3.55	3.35	4.05 ^{b2} L.A. 4.05 ^{b4}	19			
	1.5	4	1.6-8	4	4.11	3.4	1.4-6	3			3	3.35	4.10 ^{b2} S. S., S.F.	4.00			
Cold-finished	3.95 ^{b5} 4.00 ^{b2-4} 2.28-69.71	4.00	4.00	4.00		4.00	4.00	4.00	Putnam, Newark = 4.40 ^{b9} Cumberland = 3.95 ^{b2} Massillon, ^{b2} Canton ^{b4} = 4.00		4.30						
Alloy, hot-rolled	3.75	3.75					3.75	3.75	Bethlehem, ^{b3} Canton, ^{b4-2} Massillon ^{b4} = 3.75	3.75	4.05	3.75	4.80	4.75			
	1.17	1.4-23	1.6-8				3.4	1.6	28	3	12	3	82	19			
Alloy cold-drawn	4.65	4.65	4.65	4.65		4.65	4.65	4.65	Bethlehem, ^{b3} Massillon 4.82 = 4.65	4.65							
	2.17-52.69.71	2.28	4.73-74	2.61		3.70	6.57			33							
Hi Str. Low Alloy, h.r.	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	Bethlehem = 5.10 ^{b3}		5.30	5.10					
1.5	1.6	1.6-8	4	11	3	1.6	1.6	3		12	3						
PLATE Carbon steel	3.40	3.40	3.40	3.40	3.40 ^{b11}	3.40 ^{b1}	3.40 ^{b13}	3.40 ^{b1}	Coatesville = 3.50 ^{b21} Claymont = 3.50 ^{b29}	3.40 ^{b1}	3.65	3.40	4.30	4.00			
Floor plates	4.55	4.55	4.55	4.55					Minnequa, Colo. = 3.75 ^{b1} , Houston = 3.65 ^{b3}								
	1	1	8	5													
Alloy	4.40	4.40	4.40	Conshohocken = 4.40 ^{b20}		4.40		4.40	Coatesville = 4.50 ^{b21}			4.40					
	1	1	1			18		3									
Hi Str. Low Alloy	5.20	5.20	5.20	5.20	5.20			5.20	Conshohocken = 5.20 ^{b20} Geneva = 5.20 ^{b16}	5.20	5.45	5.20					
1.5	1	1.8	4.5	11				3		12	3						
SHAPES, Structural	3.25	3.25	3.25		3.25	3.30			Bethlehem = 3.30 ^{b3} , Geneva = 3.25 ^{b16}		3.30						
	1.5-9	1.23	1.6-8		11	3			Minnequa, Colo. = 3.75 ^{b1} , Houston = 3.65 ^{b3}		3						
Hi Str. Low Alloy	4.95	4.95	4.95		4.95	5.05	4.95		Bethlehem = 5.05 ^{b3}		5.05						
1.5	1	1.6-8		11	3	6				3							
MANUFACTURERS' WIRE Bright	4.15	4.15 ^{b33}	2.84	4.15	4.15	4.15	4.15	4.15	Duluth = 4.15 ^{b2} Worcester = 4.45 ^{b2} Pueblo = 4.50 ^{b4}	4.25	4.15	4.15	4.15	4.15			
	2.5-18		2.77	4.11		6		3									
PILING, Steel sheet	4.05	4.05					4.05										
	1.9	1					3										

STAINLESS STEELS

Base prices, in cents per pound,
f.o.b. producing point

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rolling.....	12.75	13.50	15.00	14.50	22.75	18.25	20.00	11.25	13.75	11.50
Slabs, billets, rolling.....	17.00	18.25	20.25	19.25	30.25	24.50	26.75	15.00	18.50	15.25
Forg. discs, die blocks, rings.....	30.50	30.50	33.00	32.00	49.00	36.50	41.00	24.50	25.00	25.00
Billets, forging.....	24.25	24.25	26.25	25.50	39.00	29.00	32.75	19.50	20.00	20.00
Bars, wire, structural.....	28.50	28.50	31.00	30.00	46.00	34.00	38.50	23.00	23.50	23.50
Plates.....	32.00	32.00	34.00	34.00	50.50	39.50	44.00	26.00	26.50	26.50
Sheets.....	37.50	37.50	39.50	39.50	63.00	45.50	50.00	33.00	33.50	35.50
Strip, hot-rolled.....	24.25	25.75	30.00	27.75	46.00	34.50	38.75	21.25	28.00	21.75
Strip, cold-rolled.....	30.50	33.00	38.50	35.00	55.00	44.50	48.50	27.00	33.50	27.50

Numbers correspond to producers. See Key below.

STAINLESS STEEL PRODUCING POINTS—Sheets: Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38, 19; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Lockport, N. Y., 46. **Strip:** Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38; W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 49; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, 13; Butler, Pa., 7. **Bars:** Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 55; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1, 67; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42. **Wire:** Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Chicago, 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28. **Structural:** Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44. **Plates:** Brackenridge, Pa., 28; Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks and rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28. **Forging billets:** Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago 1.

KEY TO STEEL PRODUCERS

With Home Offices

1 Carnegie-Illinois Steel Corp., Pittsburgh	40 Blair Strip Steel Co., New Castle, Pa.
2 American Steel & Wire Co., Cleveland	41 Superior Steel Corp., Carnegie, Pa.
3 Bethlehem Steel Co., Bethlehem	42 Timken Steel & Tube Div., Canton, Ohio
4 Republic Steel Corp., Cleveland	43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
5 Jones & Laughlin Steel Corp., Pittsburgh	44 American Chain & Cable Co., Inc., New York
6 Youngstown Sheet & Tube Co., Youngstown	45 John A. Roebling's Sons Co., Trenton, N. J.
7 Armco Steel Corp., Middletown, Ohio	46 Simonds Saw & Steel Co., Fitchburg, Mass.
8 Inland Steel Co., Chicago	47 McLouth Steel Corp., Detroit
9 Weirton Steel Co., Weirton, W. Va.	48 Cold Metal Products Co., Youngstown
10 National Tube Co., Pittsburgh	49 Thomas Steel Co., Warren, Ohio
11 Tennessee Coal, Iron & R.R. Co., Birmingham	50 Wilson Steel & Wire Co., Chicago
12 Great Lakes Steel Corp., Detroit	51 Sweet's Steel Co., Williamsport, Pa.
13 Sharon Steel Corp., Sharon, Pa.	52 Superior Drawn Steel Co., Monaca, Pa.
14 Colorado Fuel & Iron Corp., Denver	53 A. M. Byers Co., Pittsburgh
15 Wheeling Steel Corp., Wheeling, W. Va.	54 Flirt Sterling Steel & Carbide Corp., McKeesport, Pa.
16 Geneva Steel Co., Salt Lake City	55 Ingersoll Steel Div., Chicago
17 Crucible Steel Co. of America, New York	56 Latrobe Electric Steel Co., Latrobe, Pa.
18 Pittsburgh Steel Co., Pittsburgh	57 Fitzsimons Steel Co., Youngstown
19 Kaiser Co., Inc., Oakland, Calif.	58 Stanley Works, New Britain, Conn.
20 Portsmouth Steel Corp., Portsmouth, Ohio	59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
21 Lukens Steel Co., Coatesville, Pa.	60 Vanadium-Alloys Steel Co., Latrobe, Pa.
22 Granite City Steel Co., Granite City, Ill.	61 Cuyahoga Steel & Wire Co., Cleveland
23 Wisconsin Steel Co., South Chicago, Ill.	62 Bethlehem Pacific Coast Steel Corp., San Francisco
24 Columbia Steel Co., San Francisco	63 Follansbee Steel Corp., Pittsburgh
25 Copperhill Steel Co., Glassport, Pa.	64 Niles Rolling Mill Co., Niles, Ohio
26 Alco Wood Steel Co., Conshohocken, Pa.	65 Atlantic Steel Co., Atlanta
27 Midvale Co., Philadelphia	66 Acme Steel Co., Chicago
28 Allegheny Ludlum Steel Corp., Pittsburgh	67 Joslyn Mfg. & Supply Co., Chicago
29 Worth Steel Co., Claymont, Del.	68 Detroit Steel Corp., Detroit
30 Continental Steel Corp., Kokomo, Ind.	69 Wyckoff Steel Co., Pittsburgh
31 Rotary Electric Steel Co., Detroit	70 Bills & Laughlin, Inc., Harvey, Ill.
32 Laclede Steel Co., St. Louis	71 Columbian Steel & Shafing Co., Pittsburgh
33 Northwestern Steel & Wire Co., Sterling, Ill.	72 Cumberland Steel Co., Cumberland, Md.
34 Keystone Steel & Wire Co., Peoria, Ill.	73 La Salle Steel Co., Chicago
35 Central Iron & Steel Co., Harrisburg, Pa.	74 Monarch Steel Co., Inc., Indianapolis
36 Carpenter Steel Co., Reading, Pa.	75 Empire Steel Co., Mansfield, Ohio
37 Eastern Stainless Steel Corp., Baltimore	76 Mahoning Valley Steel Co., Niles, Ohio
38 Washington Steel Corp., Washington, Pa.	77 Oliver Iron & Steel Co., Pittsburgh
39 Jessop Steel Co., Washington, Pa.	78 Pittsburgh Screw & Bolt Co., Pittsburgh
Notes to Steel Price Table:	79 Standard Forgings Corp., Chicago
Special coated mfg. terres, deduct \$1.10 from 1.50-lb coke base box price. Can-making quality blackplate, 55 to 128-lb, deduct \$2.00 from 1.50-lb coke base box.	80 Driver Harris Co., Harrison, N. J.
\$ straight lengths only from producer to fabricator.	81 Detroit Tube & Steel Div., Detroit
	82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
	83 Sheffield Steel Corp., Kansas City

PIPE AND TUBING

Base discounts, f.o.b. mills
Base price, about \$200.00 per net ton

Standard, Threaded and Coupled

Steel, buttweld*	Black	Galv
1/2-in.	43 to 41	26 1/2 to 24 1/2
3/4-in.	46 to 44	30 1/2 to 28 1/2
1-in.	48 1/2 to 46 1/2	33 1/2 to 31 1/2
1 1/4-in.	49 to 47	34 to 32
1 1/2-in.	49 1/2 to 47 1/2	34 1/2 to 32 1/2
2-in.	50 to 48	35 to 33
2 1/2 to 3-in.	50 1/2 to 48 1/2	35 1/2 to 33 1/2

Steel, lapweld		
2-in.	39 1/2	26 to 24
2 1/2 to 3-in.	43 1/2 to 42 1/2	28 to 27
3 1/2 to 6-in.	46 1/2 to 43 1/2	31 to 27

Steel, seamless		
2-in.	38 1/2	23
2 1/2 to 3-in.	41 1/2	26
3 1/2 to 6-in.	43 1/2	28

Wrought iron, buttweld		
1/2-in.	+ 20 1/2	+ 47
3/4-in.	+ 10 1/2	+ 26
1 & 1/4 in.	+ 4 1/2	+ 27
2-in.	- 1 1/2	+ 23 1/2
3-in.	- 2	+ 23

Wrought iron, lapweld		
2-in.	+ 7 1/2	+ 31
2 1/2 to 3 1/2-in.	+ 5	+ 26 1/2
4-in.	list	+ 20 1/2
4 1/2 to 8-in.	+ 2	+ 22

Extra Strong, Plain Ends

Steel, buttweld		
1/2-in.	42 to 40	27 to 25
3/4-in.	46 to 44	31 to 29
1-in.	48 to 46	34 to 33
1 1/4-in.	48 1/2 to 46 1/2	34 1/2 to 32 1/2
1 1/2-in.	49 to 47	35 to 33
2-in.	49 1/2 to 47 1/2	35 1/2 to 34 1/2
2 1/2 to 3-in.	50 to 48	36 to 34

Steel, lapweld		
2-in.	39 1/2 to 38 1/2	25 to 24
2 1/2 to 3-in.	44 1/2 to 42 1/2	30 to 29
3 1/2 to 6-in.	48 to 44	33 1/2 to 31 1/2

Steel, seamless		
2-in.	37 1/2	23
2 1/2 to 3-in.	41 1/2	27
3 1/2 to 6-in.	45	30 1/2

Wrought iron, buttweld		
1/2-in.	+ 16	+ 40
3/4-in.	+ 9 1/2	+ 34
1 to 2-in.	- 1 1/2	+ 23

Wrought iron, lapweld		
2-in.	+ 4 1/2	+ 27 1/2
2 1/2 to 4-in.	- 5	+ 16
4 1/2 to 6-in.	- 1	+ 20 1/2

For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3 1/2-in. and larger four points higher discount (lower price) applies. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. *Fontana, Calif., deduct 11 points from figures in left columns.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut length 4 to 24 ft inclusive.

OD Gage	Seamless	Electric Weld
In. BWG	H.R. C.R. H.R. C.D.	
2	13 \$19.18 \$22.56 \$18.60 \$21.59	
2 1/2	12 25.79 30.33 25.02 29.41	
3	12 28.68 33.76 27.82 32.74	
3 1/2	11 35.85 42.20 34.78 40.94	
4	10 44.51 52.35 43.17 50.78	

CAST IRON WATER PIPE

Per net ton

6 to 24-in., del'd Chicago	....	\$95.70
6 to 24-in., del'd N. Y.	....	\$92.50 to 97.40
6 to 24-in., Birmingham	....	\$31.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	....	109.30
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	....

WAREHOUSE PRICES

Base prices, f.o.b., warehouse, dollars per 100 lb.
(Metropolitan area delivery, add 15c to base price except Cincinnati and New Orleans (*), add 10c; New York, Chicago and Boston, add 20c.)

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS				
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled			Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4815 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Baltimore.....	5.31	6.21-	6.95-	5.37	....	5.56	5.38	5.42	6.18	....	9.80-	10.10	....	....
Birmingham.....	4.85	5.75	6.15	4.85	....	5.10	4.90	4.90	6.59	....	....	....	....	....
Boston.....	5.55	6.45-	7.11-	5.80	6.75	5.75	5.42	5.52	6.02	9.36-	9.67-	10.72	11.02	....
Buffalo.....	4.85	5.75	7.42-	5.24	7.27	5.35	5.00	4.95	5.40	9.30	9.60	10.85	10.95	....
Chicago.....	4.85	5.75	6.85	4.85	5.45-	5.10	4.90	4.90	5.40	8.90	9.20	10.25	10.55	....
Cincinnati*	5.16-	5.84-	6.59-	5.28-	....	5.53-	5.33	5.33-	6.08-	8.74	9.99	11.19	11.44	....
Cleveland.....	5.51	6.28	6.93	5.43	....	5.85	5.48	6.20	6.20	....	....	....	....	....
Detroit.....	5.28-	6.07-	7.38-	5.27-	6.27-	5.82-	5.33-	5.33-	6.00-	9.87	9.92	11.11	11.35	....
Houston.....	5.32	6.18	7.58	5.47	6.58	5.57	5.40	5.55	6.18	....	....	....	....	....
Indianapolis.....	6.85	7.30	8.70	6.70	....	6.70	6.20	6.40	7.69	10.45	10.40	11.45	11.70	....
Kansas City.....	5.29	6.13	7.44	5.29	7.36	5.54	5.34	5.34	6.14	11.25	11.39	....	....	....
Los Angeles.....	5.50	6.40	7.50	5.50	6.85 ^b	5.75	5.55	5.55	6.10	9.55	9.85	10.90	11.23	....
Memphis.....	5.75-	6.60	7.20	5.80-	6.80	5.95-	5.75	5.75	6.53	....	....	....	....	....
Milwaukee.....	5.80	6.93	7.02	5.03	6.32	5.28	5.08	5.08	5.83	9.08	9.38	10.43	10.73	....
New Orleans*	5.95	6.75	....	6.15	....	6.15	5.95	5.95	6.65 ^b	....	....	....	....	....
New York.....	5.40	6.31	6.85-	5.62	6.78	5.65	5.33	5.57	6.31	8.28	9.58	10.83	10.93	....
Norfolk.....	6.00	....	....	6.20	....	6.05	6.05	6.05	7.05	....	....	....	....	....
Omaha.....	6.13	....	8.33	6.13	....	6.38	6.18	6.18	6.98	....	....	....	....	....
Philadelphia.....	4.95	6.24 ¹³	6.83	5.40	6.29	5.35	5.10	5.40	5.98	9.05	9.35	10.62	10.87	....
Pittsburgh.....	4.85	5.75	6.90	5.00	6.00	5.05	4.90	4.90	5.40	8.90	9.20	10.25	10.55	....
Portland.....	6.50 ^a	8.00	8.80-	6.85 ^a	....	6.30 ^a	6.35 ^a	6.35 ^a	8.25 ¹⁴	10.50 ^a	10.10 ^a	....	....	....
Salt Lake City.....	7.05	7.05	8.65	7.45 ^a	....	5.65 ^a	5.50 ^a	7.10 ^a	8.15	....	....	....	....	....
San Francisco.....	6.15 ^a	7.50 ^a	7.50	6.75 ^a	8.25 ^a	6.35 ^a	5.90 ^a	5.90 ^a	7.55	8.80	10.00	11.20	11.60	....
Seattle.....	6.70 ^a	8.15 ^a	8.80	6.70 ^a	....	6.35 ^a	6.30 ^a	6.20 ^a	8.15 ¹⁴	....	10.35 ¹⁵	....	13.10 ¹⁸	....
St. Louis.....	5.22	6.12-	7.32	5.22	6.68-	5.47	5.27	5.27	5.82	8.27-	9.57-	10.62-	10.92-	....
St. Paul.....	5.37	6.27	....	7.54	....	5.84-	5.49	5.49	6.04	9.72	9.87	11.17	11.42	....
	5.44	6.19-	7.54-	5.44	6.82	6.69	....	....	9.49	9.79	10.84	11.14	....	....

BASE QUANTITIES Standard unless otherwise keyed on prices.

Hot-Rolled:

Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

Alloy Bars:

1000 to 1999 lb.

Cold-Rolled:

Sheets, 400 to 1999 lb strip, extras on all quantities. Bars 1000 lb and over.

Galvanized Sheets:

450 to 1499 lb.

Exceptions:

(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 500 to 1999 lb; (10) 500 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) up to 1999 lb; (18) 1000 to 1499 lb; (19) 1500 to 3499 lb; (20) 6000 lb and over.

PIG IRON PRICES

Dollars per gross ton. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES						DELIVERED PRICES (BASE GRADES)							
Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Producing Point	Rail Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem.....	48.00	48.50	49.00	49.50	....	Boston.....	Everett.....	\$0.50 Arb.	....	50.50	51.00	....	....
Birmingham.....	38.88	39.38	....	....	....	Boston.....	Steelton.....	8.80	....	52.79	53.29	53.79	60.90
Buffalo.....	46.00	46.50	47.00	....	....	Brooklyn.....	Bethlehem.....	4.29	....	51.13	51.63	52.13	....
Chicago.....	46.00	46.50	46.50	47.00	....	Cincinnati.....	Bethlehem.....	6.70	45.58	46.08	....	....	....
Cleveland.....	46.00	46.50	46.50	47.00	51.00	Jersey City.....	Geneva-Ironton.....	2.63	....	52.20	....	....	....
Duluth.....	46.00	46.50	46.50	47.00	....	Los Angeles.....	Mansfield.....	7.70	53.70	54.20	....	....	....
Erie.....	46.00	46.50	46.50	47.00	....	Philadelphia.....	Cleveland-Toledo.....	3.33	49.33	49.83	50.33	54.33	....
Everett.....	50.50	51.00	....	....	Philadelphia.....	Bethlehem.....	2.39	50.39	50.89	51.39	51.89	....	....
Granite City.....	47.90	48.40	48.90	....	....	Philadelphia.....	Philadelphia.....	1.44	49.44	49.94	50.44	50.94	57.00
Ironton, Utah.....	46.00	46.50	....	....	Philadelphia.....	Philadelphia.....	3.09	....	....	....	....	....	....
Pittsburgh.....	46.00	46.50	46.50	47.00	....	Philadelphia.....	Philadelphia.....	2.63	48.63	49.13	49.63	....	....
Geneva, Utah.....	46.00	46.50	....	....	Philadelphia.....	Philadelphia.....	7.70	53.70	54.20	....	....	....	....
Sharpsville.....	46.00	46.50	46.50	47.00	....	Philadelphia.....	Philadelphia.....	3.56	49.56	50.06	50.56	....	....
Steeltown.....	46.00	46.50	49.00	49.50	54.00	Philadelphia.....	Philadelphia.....	....	....	....	....	....	....
Struthers, Ohio.....	46.00	....	....	....	....	Philadelphia.....	Philadelphia.....	....	....	....	....	....	....
Sweden.....	46.00	46.50	49.00	49.50	....	Philadelphia.....	Philadelphia.....	....	....	....	....	....	....
Toledo.....	46.00	46.50	46.50	47.00	....	Philadelphia.....	Philadelphia.....	....	....	....	....	....	....
Troy, N. Y.....	46.00	46.50	49.00	....	....	Philadelphia.....	Philadelphia.....	....	....	....	....	....	....
Youngstown.....	46.00	46.50	46.50	47.00	....	Philadelphia.....	Philadelphia.....	....	....	....	....	....	....

Producing point prices are subject to switching charges; silicon differential (not to exceed 50c per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 38c per ton for phosphorus content of 0.70 pct and over manganese differentials, a charge not to exceed 50c per ton for each 0.50 pct manganese

content in excess of 1.00 pct. 82 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.01 to 6.50 pct. C/L per g.t.t. f.o.b. Jackson, Ohio—\$59.50; f.o.b. Buffalo—\$60.75. Add \$1.00 per ton for each additional 0.50 pct Si up to 17 pct.

Add 50c per ton for each 0.50 pct Mn over 1.00 pct. Add \$1.00 per ton for each 0.75 pct or more. Bessemer ferrosilicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus \$60.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago—\$68.56. High phosphorus charcoal pig iron is not being produced.

FERROALLOYS**Ferromanganese**

18-82% Mn, Maximum contract base price, gross ton, lump size.	\$174
F.O.B. Birmingham	\$174
F.O.B. Niagara Falls, Alloy, W. Va., Welland, Ont.	\$172
F.O.B. Johnstown, Pa.	\$174
F.O.B. Sheridan, Pa.	\$172
F.O.B. Etna, Clairton, Pa.	\$175
-\$2.00 for each 1% above 82% Mn, penalty, \$2.15 for each 1% below 78%.	
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.	
Carload, bulk	10.45
Ton lots	12.05
Less ton lots	12.95

Spiegeleisen

Contract prices gross ton, lump, f.o.b.	
16-19% Mn	19-21% Mn
3% max. Si	3% max. Si
Palmerton, Pa.	\$64.00
Pgh. or Chicago	65.00
	66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.	
96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.	
Carload, packed	35.5
Ton lots	37.0

Electrolytic Manganese

F.O.B. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.	
Carloads	28
Ton lots	30
Less ton lots	32

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, delivered.	
Carloads	
0.07% max. C, 0.06% P, 90% Mn	25.25
0.10% max. C	24.75
0.15% max. C	24.25
0.30% max. C	23.75
0.50% max. C	23.25
0.75% max. C, 7.00% max. Si	25.10
	26.30
0.07% max. C, 0.06% P, 90% Mn	20.25
	22.10
	23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.	
Carload bulk	8.95
Ton lots	10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet	10.30
Ton lots	11.90
Less ton lots	12.80

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$77.00 gross ton, freight allowed to normal trade area; Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$73.50. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 for each 0.50% Mn over 1%.	
Carload bulk	8.95
Ton lots	10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet	10.30
Ton lots	11.90
Less ton lots	12.80

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.	
96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 1 lb Si briquets.	
Carload, bulk	6.30
Ton lots	7.90
Less ton lots	8.80

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size, bulk, in carloads, delivered.	
25% Si	17.00
50% Si	11.30
75% Si	13.50
85% Si	14.65
90-95% Si	16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	\$2.05	\$2.05	\$3.75
Less ton lots	2.40	3.30	4.55

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max. Si)

0.06% C	28.75
0.10% C	28.25
0.15% C	28.00
0.20% C	27.75
0.50% C	27.50
1.00% C	27.25
2.00% C	27.00
65-69% Cr, 4-9% C	20.50
62-66% Cr, 4-6% C, 6-9% Si	21.35

Briquets—Contract price, cents per pound of briquet, delivered, 60% chromium.

Carload bulk	13.75
Ton lots	15.25
Less ton lots	16.15

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.	
Carloads	21.60
Ton lots	23.75
Less ton lots	25.25
Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.	
Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, per lb chromium contained packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.20% max. C	\$1.09
0.50% max. C	1.05
9.00% min. C	1.04

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.	
Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CMSZ

Contract price, cents per pound of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.	
Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.	
Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ca 5 to 7%.	
Carload packed	17.00¢
Ton lots to carload packed	18.00¢
Less ton lots	19.50¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	17.00¢
Ton lots	18.00¢
Less ton lots	18.50¢

SMZ

Contract price, cents per pound of alloy, delivered. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.25
Less ton lots	18.50

Other Ferroalloys

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.

Carload	7.40¢
Ton lots	8.80¢

Calcium molybdate, 45-50%, f.o.b. Langloch, Pa., per pound contained Mo.

96¢

Ferrocolumbium, 50-60% contract basis, delivered, per pound contained Cb.

Ton lots	\$2.90
Less ton lots	2.95

Ferromolybdenum, 55-75%, f.o.b. Langloch, Pa., per pound contained Mo.

\$1.10

Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Mt. Pleasant, Tenn., \$3 unitage, per gross ton.

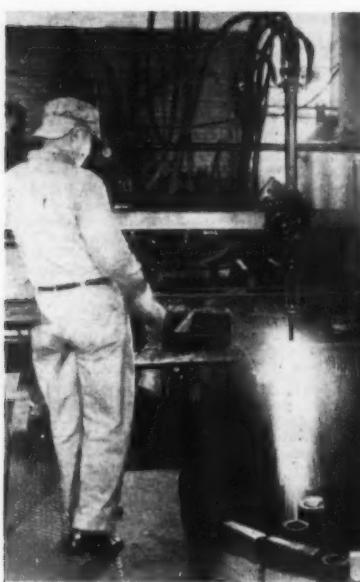
10 tons to less carload	\$65.00
10 tons to less carload	75.00

Ferrotitanium, 40%, regular grade, 10% C max., f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti.

\$1.28

Ferrotitanium, 25%, low carbon, f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti

Shaping heavy forgings faster...at less cost with machine gas cutting



NORTHERN ORDNANCE, INCORPORATED of Minneapolis, Minn., had a problem of shaping a heavy alloy steel forging into a given contour. Established methods — machining, or contour forging the rough casting to precise dimensions — were too costly of time and money.

A. P. Demmer and R. F. Helm-kamp, Airco Technical Sales Representatives, recommended oxyacetylene machine cutting the rough forging, using an Airco No. 6A Oxygraph.

Since the forging was about 70" long and 28" thick, weighing almost 7 tons, it was necessary to build special cutting support jigs — one for each cutting

requirement. Further, to handle the many cutting positions, the Oxygraph had to be raised 4' off the floor.

The operation was highly successful. The shape cutting technique proved extremely economical and fast, and the company was highly pleased with both the technical aid furnished and the results obtained.

TECHNICAL SALES SERVICE — ANOTHER AIRCO PLUS-VALUE FOR CUSTOMERS
To assure its customers of high efficiency in all applications of the oxyacetylene flame or electric arc, Air Reduction has available the broad, practical experience of its nationwide Technical Sales Division personnel. The collective experience and knowledge of these specialists has helped thousands to a more effective use of Airco processes and products. Ask about this Airco "Plus-Value" service today. Write your nearest Airco office. (In Texas: Magnolia Airco Gas Products Company . . . On West Coast: Air Reduction Pacific Company.)



AIR REDUCTION

Offices in Principal Cities

Headquarters for Oxygen, Acetylene and Other Gases . . . Calcium Carbide . . . Gas Cutting Machines . . . Gas Welding and Cutting Apparatus and Supplies . . . Arc Welders, Electrodes and Accessories

Iron Age Introduces

Continued from Page 23

Duncan C. McPhee has been made sales manager, BORDEN METAL PRODUCTS CO., Elizabeth, N. J. During his association with the firm, Mr. McPhee has spent a considerable amount of time in the company's engineering department and also in the estimating department.



CLAYTON P. YODER, sales manager, Platecoil Div., Kold-Hold Mfg. Co.

Clayton P. Yoder has been appointed sales manager of the Platecoil Div., KOLD-HOLD MFG. CO., Lansing, Mich. For many years Mr. Yoder was connected with the General Electric Co. in Erie, Pa.

D. C. Wheeler, recently elected vice-president, has been named to head the newly created Southwestern Div. of the MACK TRUCKS, INC. Mr. Wheeler came to the company in 1939 from the Reo Sales Corp., where he was vice-president.

Reginald Rowand has been appointed manager of Magnet Cove, Baroid Sales Div., NATIONAL LEAD CO., New York. Mr. Rowand joined the company in 1945. **Harold E. Billings** has been advanced to supervisor of product control in the company's production department. Since 1947 he has been cost analyst of the production department. **B. C. Elsley** has been named assistant superintendent of Baroid's bentonite plants and properties, and **Byron H. McCain** has been made

en made
METAL
N. J.
the firm,
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in the

SQUARE D's *New*

SAFETY SWITCHES

*Types A, C and D



Backed by 40 years'
DESIGN LEADERSHIP

The remarkable superiority of this new switch line is reflected in these
TYPE A design and operating features:

MODERN STYLING is both functional and attractive.

COMPACTNESS obtained without sacrifice of wiring convenience.

FULL COVER INTERLOCK has attachment that locks switch "ON" or "OFF" with 1, 2, 3 or 4 padlocks of nearly any size or shape.

SIMPLE MECHANISM—quick make-and-break action—no dead center.

SILVER-PLATED current-carrying parts.

EXPOSED BLADES permit visual

checks of switch operation.

DEAD-FRONT line terminals are protected by hinged arc chamber cover.

MAGNETIC ARC PLATE adds to unusually high rupturing capacity.

POSITIVE PRESSURE jaws and fuse clips, steel reinforced, silver-plated.

NON-TRACKING insulation used in base. Melamine insulating cross-bar.

REMOVABLE PRESSURE CONNECTORS permit substitution of solder lugs, where preferred.

*Types C and D similar to Type A in appearance—differ in construction details

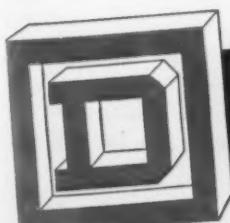
In production:

30 and 60 ampere sizes
... NOW

100 and 200 ampere sizes
... SOON

Larger ampere sizes
... LATER

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SQUARE D COMPANY CANADA LTD., TORONTO • SQUARE D de MEXICO, S.A., MEXICO CITY, D.F.

IRON AGE INTRODUCES

Continued

superintendent of bentonite mines and mills. Mr. McCain is the former supervisor of excavation.



PAUL BECKER, manager, wire and cable plant, Hazleton, Pa., Electric Auto-Lite Co.

Paul Becker has been named manager of the new wire and cable plant of the ELECTRIC AUTO-LITE CO., Toledo. Mr. Becker will direct the production of automotive and industrial wire and cable for the company.

Robert T. Blanks, Jr., has been appointed sales manager for AETNA STEEL PRODUCTS CORP. and the WOLLAEGER STEEL CORP., an Aetna Div.

J. T. Mathews has been appointed manager of the foreign engineering department, WESTINGHOUSE ELECTRIC CORP., Pittsburgh. Mr. Mathews succeeds E. P. Schroeder, who has retired after 26 years of service with the company. J. N. Jones has been appointed electrical superintendent for the Pacific Coast district. Mr. Jones has been with the company since 1936.

Robert Montgomery has been made general parts manager of WILLYS-OVERLAND MOTORS, INC., Toledo. August Benhoff, who has been with the automobile concern for the past 45 years and has been head of its

P.A. **BOSS** **FOREMAN**

We all agree on "CERTIFIED"

"I like 'Certified' Abrasives. They're extra tough, keep our blast cleaning operations at top-efficiency. Clean better, produce a better product, and that means more sales."

"'Certified' abrasives suit me to a 'T'. I always specify 'Certified' because they keep blast cleaning costs at rock bottom. Actually cost less because they can be used over and over and over."

"Blast cleaning's easier with 'Certified.' Since using Samson Shot and Angular Grit my crew turns out more work every day—and it's better work, too. Keeps costs down and makes my bosses happy!"

... Always Specify "CERTIFIED"

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PITTSBURGH, PENNA.

STEEL SHOT AND GRIT CO.
BOSTON, MASS.

ANGULAR GRIT
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PITTSBURGH CRUSHED
STEEL CO.
PITTSBURGH, PA. U. S.
USE NO HOOKS

STEEL SHOT
REG. U. S. PAT. OFF.
MANUFACTURED BY
PITTSBURGH CRUSHED
STEEL CO.
PITTSBURGH, PA. U. S.
USE NO HOOKS



...then specify ALCOA Alumina for refractories and refractory porcelains

The single-barrel, double and multiple-barrel porcelain tubes, illustrated above, are used as combustion tubes, pyrometer protection tubes and high temperature thermocouple insulators. The manufacturer can guarantee them for temperatures as high as 2900° F., because they are fortified with ALCOA Alumina.

The higher the ALCOA Alumina content in porcelains such as these, in refractory brick and other high-temperature ceramics, the better the performance. Why? Because ALCOA Alumina gives refractories and other

ceramics these outstanding qualities:

- High strength and better stability under load at high temperatures.
- Lower coefficient of expansion.
- High resistance to both thermal and mechanical shock.
- Negligible porosity and shrinkage.
- Better resistance to spalling at high temperatures.
- Better resistance to corrosive slags and gases.

These performance characteristics increase as the ALCOA Alumina content increases!

We do not make refractories or other kinds of ceramics, but we'll gladly tell you how the use of ALCOA Alumina will *better* the performance of the ceramic products you manufacture or use. Write to: ALUMINUM COMPANY OF AMERICA, CHEMICALS DIVISION, 1781 Gulf Building, Pittsburgh 19, Pa.

The high-temperature refractory porcelains, illustrated above, are manufactured by McDanel Refractory Porcelain Co.



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PERKINS Precision

Gears in



Production Quantities

AT COMPETITIVE PRICES

Whatever your custom gear requirements may be, here in our modern plant we have all conceivable facilities for providing practically every type of gear from any material in any size and in any quantity to your specifications at competitive prices.

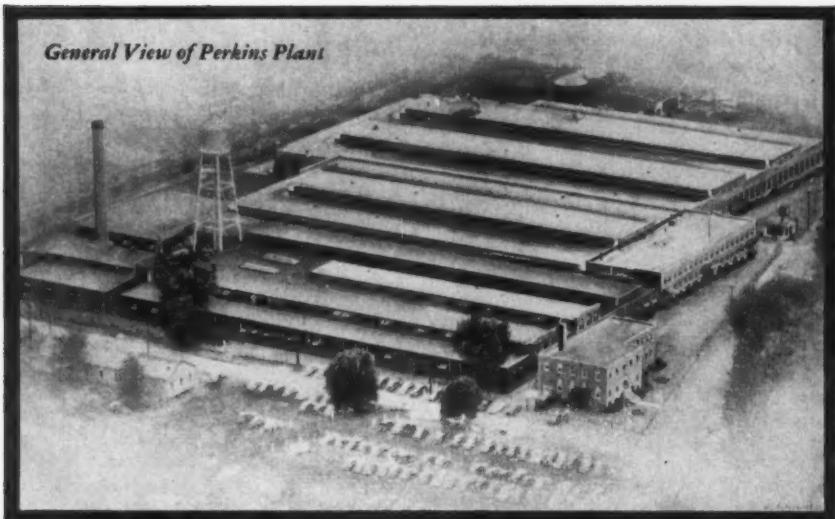
Experienced engineers with a nation-wide reputation for ability in gear design and transmission problems are at the disposal of Perkins customers.

FOR SUGGESTIONS, IDEAS & COST ESTIMATES, WRITE OR PHONE US TODAY

Springfield  7-4751

PERKINS MACHINE & GEAR COMPANY
West Springfield, Massachusetts

General View of Perkins Plant



IRON AGE INTRODUCES

Continued

parts department for the past 36 years, will remain in active duty with the company to assist Mr. Montgomery in an advisory capacity.



THOMAS P. RHOADES, director of public relations, Hudson Motor Car Co.

Thomas P. Rhoades has been appointed director of public relations for the HUDSON MOTOR CO., Detroit. For 14 years Mr. Rhoades was a member of the editorial and advertising staffs of the Indianapolis News.

C. H. Hosterman has been appointed manager of the general apparatus department, ELLIOTT CO., Jeannette, Pa. He is the former manager of the company's accessories department. Harry A. Erb has rejoined the firm as assistant to M. A. King, vice-president in charge of engineering. For the past 6 years Mr. Erb has been steam turbine department service manager for Worthington.

E. E. Baker has been elected vice-president of the public works pump division, HAMILTON - THOMAS CORP. Mr. Baker has been with the company since 1945. W. G. Rosendahl has been named vice-president of the company's machine tool division and has been with the organization since 1941, when he joined as general superintendent.

Walter J. Herbut has been promoted to chief tool designer of AUTO-DIESEL PISTON RING CO., Cleveland. Mr. Herbut, who has been with the

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THERE are three major reasons why it's to your advantage to "Call Us" for all your alloy steel requirements:

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UNITED STATES STEEL

IRON AGE INTRODUCES

Continued

why starve your automatics . . .

FOLLANSBEE COLD ROLLED STRIP feeds right from the coil into your automatic machines. There's real efficiency and time-saving economy in the continuous supply of presses, roll-formers, and other automatics. These high-speed machines need never starve for material because you can feed Follansbee Cold Rolled Strip directly from the coil.

making gadgets for gourmets?

FOLLANSBEE COLD ROLLED STRIP is manufactured in a range of tempers, and with the proper finish, for making turners, mixers, beaters, and a myriad other profitable specialties. Custom-made Follansbee Cold Rolled Strip, in continuous coils, is furnished to your specifications. You should be taking advantage of the machining quality of Follansbee Cold Rolled Strip and Follansbee Polished Blue Strip. Just call the Follansbee Steel Representative nearest you.

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SEAMLESS TINNED ROLL ROOFING

Sales Offices—New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee. Sales Agents—Chicago, Indianapolis, St. Louis, Kansas City, Nashville, Houston, Los Angeles, San Francisco, Seattle; Toronto and Montreal, Canada.

Plants—Follansbee, W. Va., and Toronto, Ohio.

Follansbee Metal Warehouses—Pittsburgh, Pa., Rochester, N. Y., and Fairfield, Conn.



company for the past 15 years, will be in charge of tool design and development coordinated with the special production and milling operations.



HAROLD R. RYAN, Superintendent of Brier Hill Open Hearth Dept., Youngstown Sheet & Tube Co.

Harold R. Ryan has succeeded Paul Johnson as superintendent of the Brier Hill open hearth department, YOUNGSTOWN SHEET & TUBE CO., Youngstown. Since 1947 Mr. Ryan has been assistant superintendent of the open hearth department in the Indiana Harbor plant.

Elmer H. Riddle has been appointed superintendent, blast furnace department, Aliquippa Works, JONES & LAUGHLIN STEEL CORP., Pittsburgh. Mr. Riddle was formerly assistant superintendent and has been connected with the blast furnace department for the past 22 years.

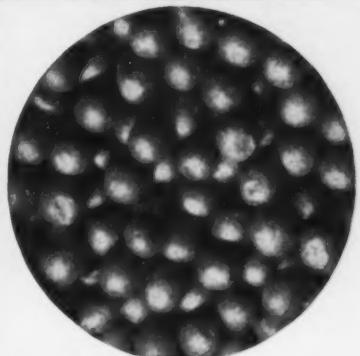
Richard T. McCauley has been appointed assistant in charge of government relations, Portable Products division, the HERMAN NELSON CORP., Moline, Ill. For the past four years, Mr. McCauley has served as a public relations officer in the office of the Secretary of Air Force and Secretary of Defense.

Richard G. Johnson has been made sales manager of VAN AUKEN, INC., a subsidiary of Penn-Ohio Steel Corp.

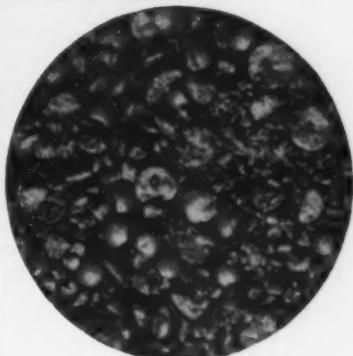
SEE how you save on shot with TRU-STEEL

COMPARISON -- TRU-STEEL vs. CHILLED IRON SHOT

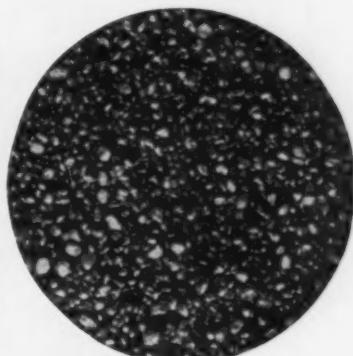
Showing relative breakdown after a given number of passes through a centrifugal blasting wheel



NEW SHOT



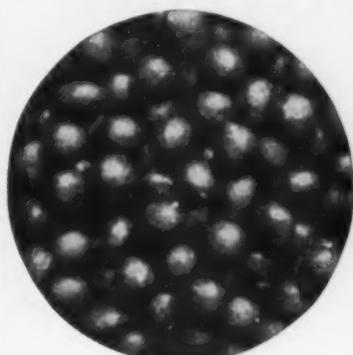
AFTER 50 PASSES



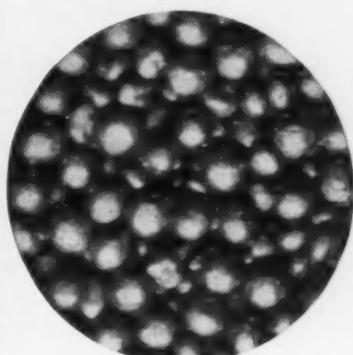
AFTER 1500 PASSES



NEW SHOT



AFTER 50 PASSES



AFTER 1500 PASSES

Selected TRU-STEEL shot has no equal economy and performance. It is new — different — a genuine true steel that received a full heat treatment, not just draw or anneal.

You can expect top performance and real economy from TRU-STEEL because of its exclusive features: it is round and hard — hard and tough — fully heat treated — wears down, but does not break — accurately graded and controlled in quality and hardness.

Performance Characteristics

1. Cleans as fast — or faster — than chilled iron shot.
2. Reduces machine maintenance costs.
3. Increases life of machine parts.
4. Lasts many times longer than chilled iron shot.
5. Saves storage space and transportation costs.
6. Reduces cleaning costs per ton.

GET THE FACTS - Write for complete details.

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IMMEDIATE DELIVERY all sizes

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Money-Saving Results

"We are using a 27" x 36" Wheelabrator for cleaning alloy steel forgings after annealing and after heat treatment for plating. TRU-STEEL shot cleans work in the same length of time or less than ordinary shot, and the surface produced is very satisfactory for plating or painting."

"We find TRU-STEEL shot lasts from 5 to 6 times as long as ordinary shot."

"Blades used to last at the most 50 Wheel hours with ordinary shot — with TRU-STEEL approximately 400 hours."

"Our wheel has been operating over 800 hours at this point perfectly satisfactorily."

"In general TRU-STEEL shot costs half as much as ordinary shot, cuts down on maintenance and costly parts with less shot handling and storage."

GRAY FORGINGS & STAMPINGS LIMITED

Fastening Operations Cost Less with an

ACME-MORRISON METAL STITCHER

and are done faster . . . stronger . . . neater

If you fasten sheet metal to metal or any non-metallic material, here's why you should do the job with an Acme-Morrison Metal Stitcher:

- 1 **To save time.** In one operation, forms its own stitch or staple from a continuous coil, drives it through the material, and clinches it at the rate of 280 per minute.
- 2 **To save material.** Replaces rivets, screws, nails, bolts and spot welding with inexpensive wire stitches.
- 3 **To save money . . . by increasing production, eliminating costly, unnecessary operations.** No pre-punching, pre-drilling, matching or inspection required.

For example: A furnace manufacturer cut an assembly cost from 17½¢ to 3½¢ per unit by replacing rivets with wire stitches. A maker of insecticide spray guns reduced his labor costs 38%, and cut material costs 91%, by replacing two screws with wire stitches.

Find out how similar savings can be applied to your assembly line. Mail the coupon today.

STITCHING WIRE DIVISION

ACME STEEL COMPANY

NEW YORK 17

ATLANTA

CHICAGO 8

LOS ANGELES 11

ACME STEEL COMPANY, Dept. IA-109
2840 Archer Avenue, Chicago 8, Illinois

- Send booklet on "Metal Stitching."
- Have representative call.

Name _____

Company _____

Address _____

City _____ Zone _____ State _____



Composition board and impregnated fibreboard being fastened together with the Acme-Morrison Metal Stitcher.



CROSS-SECTION VIEWS OF STITCHES



IRON AGE INTRODUCES

Continued

Birdsboro, Pa. Mr. Johnson is the former sales manager of Cello Products Co., Boston.

J. J. Fitzpatrick and R. H. Grimes have been appointed district representatives in the Berger Building Products Sale Div., REPUBLIC STEEL CORP., Cleveland. Mr. Fitzpatrick will work out of the Indianapolis branch warehouse and Mr. Grimes has taken a similar position at the St. Louis warehouse.

OBITUARY

Frank R. Bacon, chairman of the board, Cutler-Hammer, Inc., died Oct. 6.

Lewis L. Middleton, vice-president, Sheffield Steel Corp., died Sept. 19.

Sarge Peter Kovaleff, 50, vice-president, Enterprise Engine & Foundry Co., died Oct. 5.

Douglas B. Hobbs, 49, public relations executive, Aluminum Co. of America, died Oct. 11.

Harry A. Smith, 70, president, Smith-Mathews Foundry Co., died Oct. 11.

James H. Spade, 59, Los Angeles district sales manager, Allegheny Ludlum Steel Corp., died recently.

William B. Guernsey, 45, assistant to the vice-president, American Bridge Co., died Oct. 12.

Paul W. Lyon, manager of market research, Wheeling Steel Corp., died Oct. 14.

Leon G. Morrill, 66, retired New England Manager of the George H. Morrill Div., Sun Chemical Corp., died Oct. 10.

George A. Cardwell, 67, manager alloy sales, Lukens Steel Co., died Oct. 13.

Harry Raphael, 59, J. Trockman & Sons, Inc., died Oct. 7.

Resume Your Reading on Page 24

RELIANCE Job-Fitted STEEL SERVICE



DEPENDABLE DAN
OUR CUSTOMERS' MAN

Pays Off According To Your Need

COLD ROLLED STRIP STEEL

- COILS
- CUT LENGTHS
- ALL TEMPS

IMMEDIATE SHIPMENT

from WAREHOUSE or
MILL DEPOT or
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ON SHORT NOTICE

THICKNESS—.008" to
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Round
FINISH—Regular Bright or
Satin
SPRING STEEL—up to
.80% (full hard or
annealed)

DETROIT STEEL STRIP
IS STRIP STEEL IN
NAME AND IN FACT



Regardless of Your Problem

RELIANCE CAN SAVE
YOU TIME AND MONEY

SHEET STEEL

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- HOT ROLLED PICKLED
- LONG TERNE
- GALVANIZED

IMMEDIATE SHIPMENT

from WAREHOUSE STOCKS

Standard or Production
Sizes or Sheared or Slit
to Your Actual Working
Dimensions

PRIME QUALITY or COST SAVING SECONDS

RELIANCE
JOB-FITTED METHODS
APPLY TO SECONDS
AS WELL AS PRIMES

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EASTERN PLANT, State & Edmund Sts. (Hamden), New Haven 7-5781, New Haven 7, Conn.
MIDWEST PLANT, 1801 South Wolcott Ave., CANal 6-2442, Chicago 8, Ill.

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GRAND RAPIDS 2, MICH., 326 Keefer Bldg., Gladwin 6-9569
INDIANAPOLIS 4, IND., 1488 Fischer Trust Bldg., Franklin 3429
WORCESTER 8, MASS., 329 Main St., Worcester 5-8888
JACKSON 18, MICH., 801 Reynolds Bldg., JACKson 3-3226
NEW YORK 19, N. Y., 250 West 57th St., COLUMbus 5-4878
ST. LOUIS 9, MO., 4653 Lindell Blvd., LUCas 4550
TOLEDO 4, OHIO, 2114 Ohio Bldg., GARfield 8384

• News of Industry •

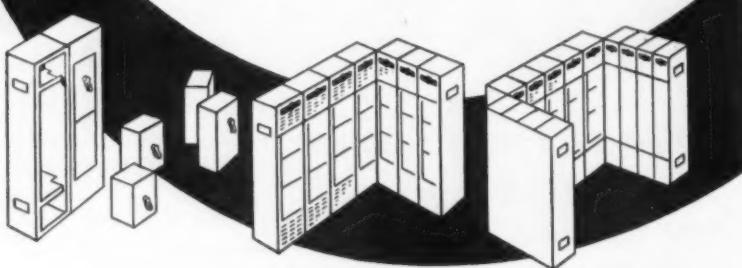
MODERNIZATION *made easy*



... Motor Control Centers



Use standardized, low-cost G-E motor control centers for 1 to 100-hp a-c motors. Save on installation, operation, and servicing. Save on space—vertical sections 12 inches deep, front connected. Save on wiring—"clothespin contact" means connection to incoming power in one quick shove—roomy five-inch-wide wiring troughs easily reached. Terminals and incoming bus may be at top or bottom.



Protection to equipment and personnel assured. Each unit (NEMA Size 1, 2, 3, and 4 for 440 volts or below) is completely metal enclosed, has short-circuit and overload protection built in. Standard parts mean few spare parts to store, speed servicing. Locate all your control in one place, wherever space and operating conditions demand it. You'll like the easy way to modernize with G-E motor control centers. Write for Bulletin GEA-4979 for more details on this low-cost equipment. Apparatus Dept., General Electric Company, Schenectady 5, N. Y.

GENERAL ELECTRIC

More New Products Being Shipped by Inland Waterway

Chicago — Increased tonnages of new commodities are being shipped via the Inland Waterway System. Chester C. Thompson, president, American Waterways Operators, said, "While more and more of the better known bulk commodities such as coal, petroleum, steel, grain and sulfur are being moved in barge load lots by the river carriers, development of new industrial plants along improved inland rivers and canals has turned a vast new trade to the river carriers."

The principal traffic in new commodities is coming from the rapidly expanding chemical industry. The barge lines are developing specially built equipment for the transportation by water of such new commodities as highly perfected chemicals, compounds and acids for the plastic, drug and other trades. Also increasing in tonnage are such items as lead, molasses, tin, magnesium and a variety of packaged goods.

A large part of the new products originate in Texas and the Southwest through ports of Mobile, New Orleans and Houston-Galveston.

Studies Water Pollution

Washington — Federal control over industrially-polluted waters probably will be limited to "one or a few" river basins during the present fiscal year.

The U. S. Public Health Service has received a recommendation that an initial federal appropriation of \$200,000 be limited to planning sewage treatment works on a selected few river basins, rather than allocated throughout the country.

Federal spending for control of water pollution was authorized by Congress last year. The Public Health Service is charged with administration of the program which will cost the federal government about \$2.7 million during the first year.

Team Your Production with Aluminum Sheets from Wolff Metal Service



You're sure to maintain production runs because Wolff has diversified stocks available for immediate shipment.

Aluminum sheets — Reynolds aluminum sheets — are available today at Wolff Metal Service in a wide range of alloys, gauges, sizes and tempers. Here is a resource that you can team with right now to step-up your productive capacity . . . for aluminum can be fabricated more readily, with less trouble and in less time than many other metals. You know that — but do you know how it applies to your work and your equipment?

A Wolff representative will welcome the opportunity of discussing the potential Reynolds aluminum holds for you — a potential that has provided increased volume and lowered costs for hundreds of alert midwestern fabricators of metals. Their increasing demand for aluminum has made Wolff one of the country's largest sources of supply for this incentive metal.

Wolff's complete stocks are at your service for immediate delivery. Write or phone WALbrook 5-3200.

Carbon Steels, Stainless Steels, Aluminum, Copper, Tinplate, Metal Decorating



BENJAMIN WOLFF AND COMPANY

General Office and Warehouse — 5800 South Seeley Ave., Chicago 36, Ill.

Wisconsin Office — 176 W. Wisconsin Ave., Milwaukee 3, Wis.

Job File No. 1949

MALLEABLE NUT PRODUCTION
Fully Automatic
CONTROLLED BY T-J CYLINDERS

All moving parts are controlled hydraulically by T-J Cylinders—on this Malleable Nut Production Machine designed and built by Roy Hays & Associates, Rockford, Ill., for the Wagner Malleable Products Co., Decatur, Ill.

It's fully automatic—the operator only places nuts in stations. Nine T-J Cylinders, 40 ton to $\frac{1}{2}$ ton, help complete the job of cutting off sprue, sizing, boring, facing, chamfering and threading 2,500- $\frac{3}{4}$ std. pipe thread nuts per hour.

For your tough jobs of power movement—pushing, pulling or lifting—*save labor, speed production and cut costs* with T-J Air and Hydraulic Cylinders! Many standard sizes and styles... both cushioned and non-cushioned types... 100 lb. or 50,000 lb. Precision-built for long-life dependability. Write for latest catalogs. The Tomkins-Johnson Co., Jackson, Mich.

FOR POWER MOVEMENT IN ANY DIRECTION

100 LB. or 50,000 LB.

T-J
TOMKINS-JOHNSON
 RIVITORS AIR AND HYDRAULIC CYLINDERS CUTTERS CLINCHORS

FREE

PUBLICATIONS

Continued from Page 34

well as mail sorting racks and hotel form files. Haskell Mfg. Co., Inc. For more information, check No. 11 on the postcard on p. 35.

Crane Carriage

A heavy duty chassis for mounting cranes and crane applications, including clamshells, magnets, draglines and log loaders, are described in pamphlet entitled Keystone Krane Karriage. Keystone Driller Co. For more information, check No. 12 on the postcard on p. 35.

Centrifugal Pumps

Bulletin AH-547 provides 8 p. of construction details and selection charts on latest line of B & G centrifugal pumps. Bell & Gossett Co. For more information, check No. 13 on the postcard on p. 35.

Enamel Reflectors

Porcelain enamel reflectors of the shallow, standard, deep bowl and angle types are described and illustrated in bulletin 123. Steber Mfg. Co. For more information, check No. 14 on the postcard on p. 35.

Shapers-Planers

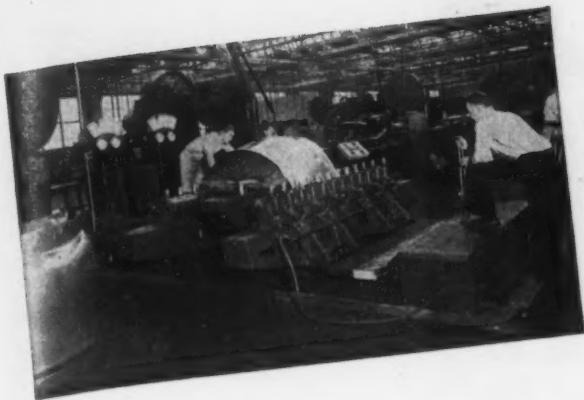
Profusely illustrated 34-p. brochure in color describing shapers, planers, shears, press brakes and special equipment includes dimensions and specification charts. Cincinnati Shaper Co. For more information, check No. 15 on the postcard on p. 35.

Heat Exchangers

Shell and tube heat exchangers are illustrated and described in 6-p. pamphlet. Young Radiator Co. For more information, check No. 16 on the postcard on p. 35.

Worm Gear Reducers

Illustrated 24-p. catalog No. 40-S contains engineering data and price lists on single and double



FORGING
EXTRUDING
DEEP PIERCING
STRETCH FORMING

OPERATION TORRID!

CASTING
STAMPING
WIRE DRAWING
MOLD STRIPPING

THESE metal forming operations, performed at 400° F. and up, need constant, positive lubrication to battle friction. When conventional lubricants fail, then versatile "dag" colloidal graphite dispersions will . . .

in deep piercing—produce smooth forgings to close tolerances . . . and reduce die damage
in casting and mold stripping—insure smooth surfaces and clean parting
in wire drawing — assure longer die life and uniform diameter
in forging—minimize scaling and sticking . . . improve finish . . . lengthen die life
in stretch forming—reduce tearing and rippling
"dag" colloidal graphite dispersions, when applied to fric-

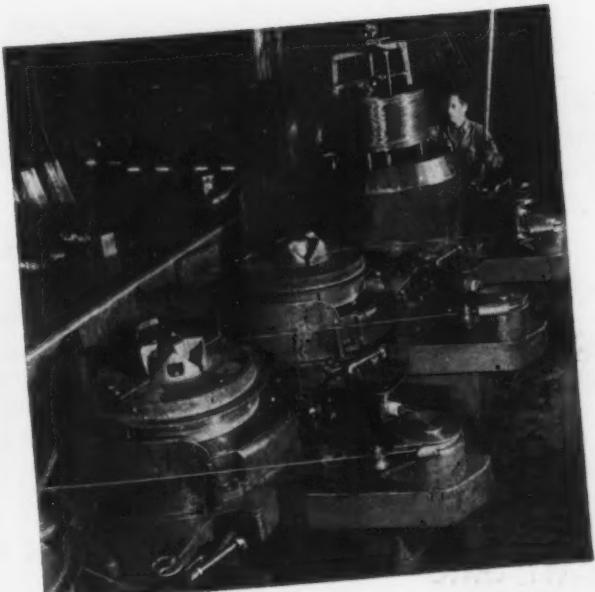
tion surfaces of metals, create an extremely low coefficient of friction, resist oxidation, and function at temperatures well above the burning point of oil.

Use "dag" colloidal graphite dispersions as lubricants for all your metal forming operations, save wear and tear on machines, and get better products and fewer rejects.

Acheson Colloids engineers can show you how to secure positive lubrication at high temperatures, 400° F. and up, with "dag" colloidal graphite dispersions. Send coupon NOW . . . detailed information will follow.

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ACHESON COLLOIDS CORPORATION, Port Huron, Michigan



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Port Huron, Michigan

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 Send a sales engineer at my convenience

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R-13

A Good Coolant Pump...

Saves You Money!



Photo Courtesy
The Oilgear Co.
Illustrated is an Oilgear
Type XM-30 x 54" stroke
Vertical Cyclematic
Broaching Machine
equipped with Ruthman
Gusher Pump.



Specify

RUTHMAN GUSHER COOLANT PUMPS

Ruthman Gusher Coolant Pumps save you money in two important ways.

1—Designed to do the job better, more efficiently, Ruthman Coolant Pumps offer you features that will help you raise production on your metal-cutting machinery. They give instantaneous coolant flow, split-second control of coolants from a trickle to full volume and use less power when throttled.

2—Precision-built of the best materials, Ruthman Gusher Coolant Pumps are dynamically balanced. Vibration and wear is cut to the minimum, assuring long trouble-free service.

Write us today—we will be glad to submit literature and any other information you may require.

THE RUTHMAN MACHINERY CO.

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CINCINNATI, OHIO



FREE PUBLICATIONS

Continued

worm gear speed reducers. D. O. James Gear Mfg. Co. For more information, check No. 17 on the postcard on p. 35.

Cavitation Prevention

Illustrations, details and formulas in new 12-p. bulletin explain latest methods of prevention and reduction of cavitation and pitting in hydraulic turbines. Allis-Chalmers. For more information, check No. 18 on the postcard on p. 35.

Roll Forming Machines

How Ardcor roll forming machines form, curve, emboss, and cut in one continuous operation is described and illustrated in 4-p pamphlet. American Roller Die Corp. For more information, check No. 19 on the postcard on p. 35.

Rolling Steel Doors

Catalog G-49 offers 16 p of illustrations, details, and charts pertinent to the proper selection of rolling steel doors for industrial plants. R. C. Mahon Co. For more information, check No. 20 on the postcard on p 35.

Ramming Material

Chromix, a chrome base plastic ramming material adapted for construction of monolithic furnace hearths, is described in 4-p pamphlet. Quigley Co. For more information, check No. 21 on the postcard on p 35.

Punch Press Roll Feeds

New illustrated data sheet describes line of roll feeds and dial feeds for all makes of punch presses. Also described are straightening machines, air-blast valves, Pres-Vac safety feeders and mechanical pickers. Coil weight calculating chart is also available. F. J. Littell Machine Co. For more information, check No. 22 on the postcard on p. 35.

Resume Your Reading on Page 35

SUPERFINISH STARTS - OR STOPS - AT SCRATCH!

Perhaps you've thought of Superfinish only in terms of ultra-smooth surfaces. Not always! Here's one where the process has been stopped—controlled at a surface roughness of 10 micro inches. Note, in this magnification, how the abrasive grits have moved in paths which never duplicate, leaving a crosshatch pattern. For certain applications, such partially Superfinished surfaces have two distinct advantages: (1) removal of the soft "smear metal" left by grinding heat, (2) the cross-hatch pattern maintains uniform distribution of lubricant to discouragealling.

Superfinish has many other interesting applications. Write on your letterhead for the booklet, "Wear and Surface Finish."

**GISHOLT
MACHINE COMPANY**
Madison 10, Wisconsin

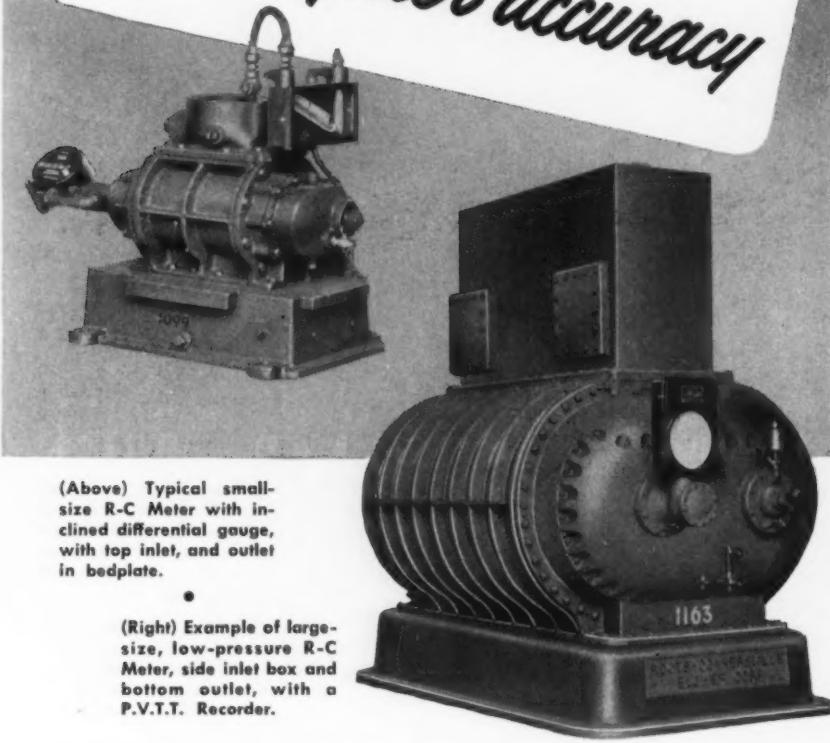


THE GISHOLT ROUNDTABLE
represents the collective experience of specialists in the machining, surface finishing and balancing of round and partly round parts. Your problems are welcome here.

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

MEASURE AIR OR GAS WITH

cash-register accuracy



(Above) Typical small-size R-C Meter with inclined differential gauge, with top inlet, and outlet in baseplate.

(Right) Example of large-size, low-pressure R-C Meter, side inlet box and bottom outlet, with a P.V.T.T. Recorder.

Built-in characteristics of R-C Positive Displacement Meters insure unfailing, long-time accuracy:

1. Accuracy is not affected by variations in specific gravity, rate of flow, pulsation, moisture or impurities.
2. Accuracy does not depend on uncontrollable factors.
3. Accuracy is not subject to adjustment of meter or recorder by operators.
4. Accuracy is not affected by reasonable overloads.
5. Accuracy is permanent because measuring chambers are surrounded by precision-machined cast iron surfaces.

R-C Meters are built in 31 standard sizes, with capacities from 4,000 to 1,000,000 CFH. Indicating and recording instruments are available for all types. Send for details in Bulletin 40-B-14 or write us about your specific problem.

ROOTS-CONNERSVILLE BLOWER CORPORATION
910 Ohio Avenue, Connersville, Indiana

Roots-Connersville

BLOWERS • EXHAUSTERS • BOOSTERS • LIQUID AND VACUUM PUMPS • METERS • INERT GAS GENERATORS

* * * ONE OF THE DRESSER INDUSTRIES * *

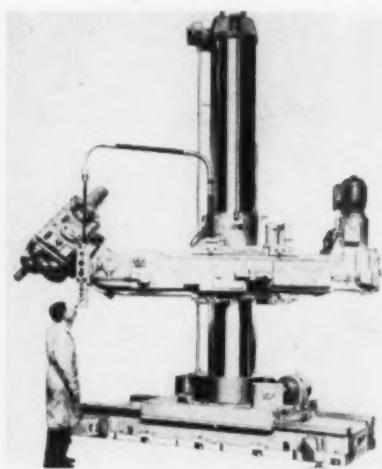


NEW

PRODUCTION IDEAS

Continued from Page 38

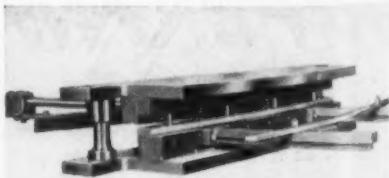
nine speeds in a choice of three ranges from 25 rpm to 800 rpm. The spindle head swivels 360° on the trunnion and the trunnion rotates 180° on the rails, permitting the spindle to be positioned in any



combination of vertical, horizontal and radial positioning movements. Total horizontal movement along the rails is 36 in., total vertical movement is 60 in. The 22-in. column which carries the rail unit can be swiveled through 360° while the column base has a 48-in. travel on a heavy runway. All movement is power driven and is centrally controlled. *Kaukauna Machine Corp.* For more information, check No. 34 on the postcard on p. 35.

Shearing Die Attachment

With a shearing die attachment, a Diamond Model 3048 Multi-Max punch press can be converted into



a 10 gage, 48 in. power squaring shear in approximately 15 min. Adjustable front and back gages

Continued on Page 123

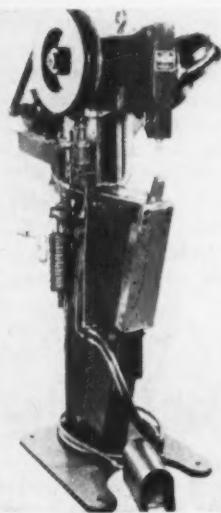
NEW PRODUCTION IDEAS

Continued from Page 120

have a maximum range of 24 in. each. Hold downs are one piece construction, stripper type spring loaded. Alloy steel blades have four cutting edges and slope $\frac{3}{8}$ in. per foot. The shearing die attachment is mounted in an all-steel die set with two 2-in. diam hardened and ground leader pins. The attachment weighs 1075 lb. Diamond Machine Tool Co. For more information, check No. 35 on the postcard on p. 35.

Clinch Nut Setter

To automatically feed and set standard square neck cased nuts, and for handling floating type cased nuts and Fabri-Steel nuts, an underfeed cylinder is available in a standard model with vertical anvil and anvil guide, and a special model with inclined anvil and anvil guide. The operator loads clinch nuts into a hopper at the top of the machine, that feeds the nuts by



means of an in-built underfeed mechanism, to the anvil. The part is placed in the machine with the clinch nut located in the hole in the part. Pressing the foot pedal causes the ram to set the clinch nut firmly in the part. When one nut is set, the underfeed mechanism reloads the anvil ready for the next operation. The machine is fully automatic. Capacity is $9/16$ to $3/4$ in. OD D type clinch nuts, $17/32$ to $29/32$ in. square case type

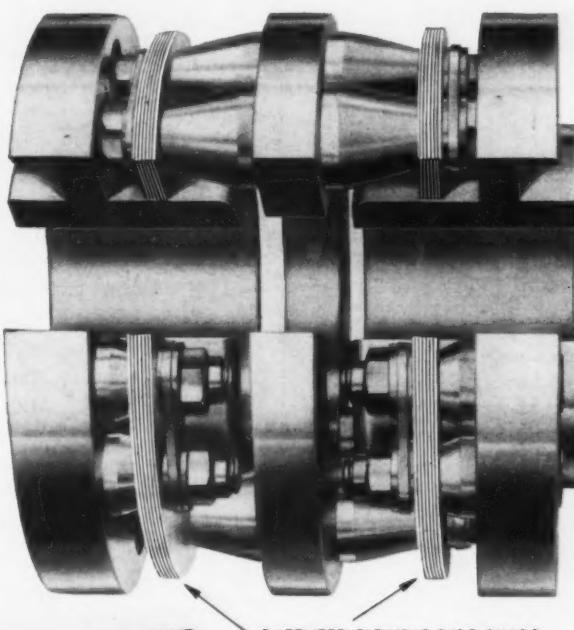
THOMAS Flexible ALL METAL COUPLINGS

FOR POWER TRANSMISSION • REQUIRE NO MAINTENANCE

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

Thomas Couplings have a wide range of speeds, horsepower and shaft sizes: $1/2$ to 40,000 HP — 1 to 30,000 RPM.

Specialists on Couplings for more than 30 years



BACKLASH
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CROSS-PULL
are eliminated
LUBRICATION IS
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THE THOMAS PRINCIPLE GUARANTEES
PERFECT BALANCE UNDER ALL
CONDITIONS OF MISALIGNMENT.

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NO MAINTENANCE PROBLEMS.

• • •
ALL PARTS ARE
SOLIDLY BOLTED TOGETHER.



Write for the latest reprint of our Engineering Catalog.

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

HOW ONE PLANT
Streamlines
MATERIAL HANDLING



Here's another example that shows how you can get fast, low-cost materials handling, right now. Before installing a Reading engineered system, this plant had to wheel heavy barrels to the mill via hand trucks. To streamline the operation, Reading Engineers were called in. A one-ton Reading Electric Hoist, operating on a built-in parallel trolley, was recommended. Now barrels move faster—less manpower is tied up—and the entire operation costs far less! Let Reading Engineers give you practical suggestions that can streamline your handling operations. Drop us a line for full details. No obligation, of course.



READING CHAIN & BLOCK CORPORATION
2101 ADAMS ST., READING, PA.

CHAIN HOISTS • ELECTRIC HOISTS
OVERHEAD TRAVELING CRANES

**READING
HOISTS**

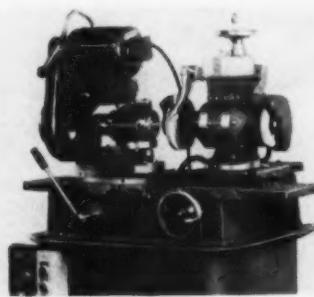
NEW PRODUCTION IDEAS

Continued

clinch nuts, and extruded type clinch nuts. Range of throat depths is 8 to 36 in. Tomkins-Johnson Co. For more information, check No. 36 on the postcard on p. 35.

Tool Grinder

A new model of the power driven D-S Radial Relief Tool Grinder for the grinding of production tools in volume features a self-contained



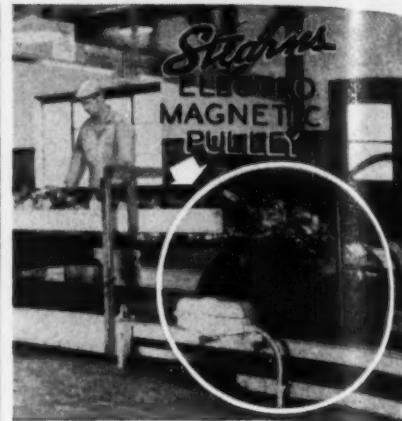
coolant system with tank and pump and stepless speed control from 18 to 150 rpm at the turn of a dial. The speed control gives the operation a hand touch and permits finish grinding to take place at the optimum speed. Cams for tools of 1 to 14 flutes can be readily interchanged. Royal Oak Tool & Machine Co. For more information, check No. 37 on the postcard on p. 35.

Tool Holder

A new tool holder to accommodate large boring and internal threading tools provides quick and accurate vertical adjustment



through the use of a conveniently located adjusting screw. The holder is bored to take 1½-in. diam shanks directly, and with split bushings will accept shanks down to ½ in. diam. Ground gage pad



Protect

**YOUR MACHINERY
with a STEARNS
MAGNETIC PULLEY!**

Metallic refuse can cause costly repairs and possible shut-downs but at the American Crystal Sugar plant in Moorhead, Minn., a Link-Belt installation, this Stearns Electro-Magnetic Pulley helps guard against trouble.

If you want automatic low-cost protection against tramp iron hazards, consult Stearns Magnetic — our engineers have the know-how and experience to solve your problem. Years of research and development by Stearns engineers have produced an outstanding product in magnetic pulleys — the reason for their wide acceptance in all industries for removing tramp iron, for separation and reclamation of materials.

For complete specifications and operating data on Stearns Electro and Permanent Magnetic Pulleys and Pulley Separators, write for Bulletins 303 and 350.



Electro and Permanent Magnetic Pulleys and Pulley Separators to fit your needs.

**IF IT'S MAGNETIC
WE MAKE IT!**

PULLEYS • BRAKES • DRUMS
CLUTCHES • SEPARATORS
FILTERS • ORE CONCENTRATORS
Separation or Lifting MAGNETS

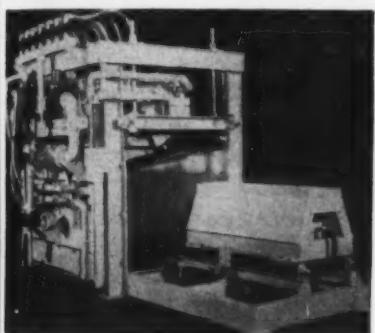
**Stearns
MAGNETIC
MANUFACTURING CO.**

635 S. 28th St., Milwaukee 4, Wis.

located exactly 1.375 in. over the center of bore provides the reference surface for making adjustments required in setting up helically backed-off boring tools. It is also helpful in making adjustments for taper boring and threading. A companion piece is the holder of fixed height designed for and installed permanently in a particular lathe, and offering the same features. *Bokum Tool Co.* For more information, check No. 38 on the postcard on p. 35.

Brazing Machine

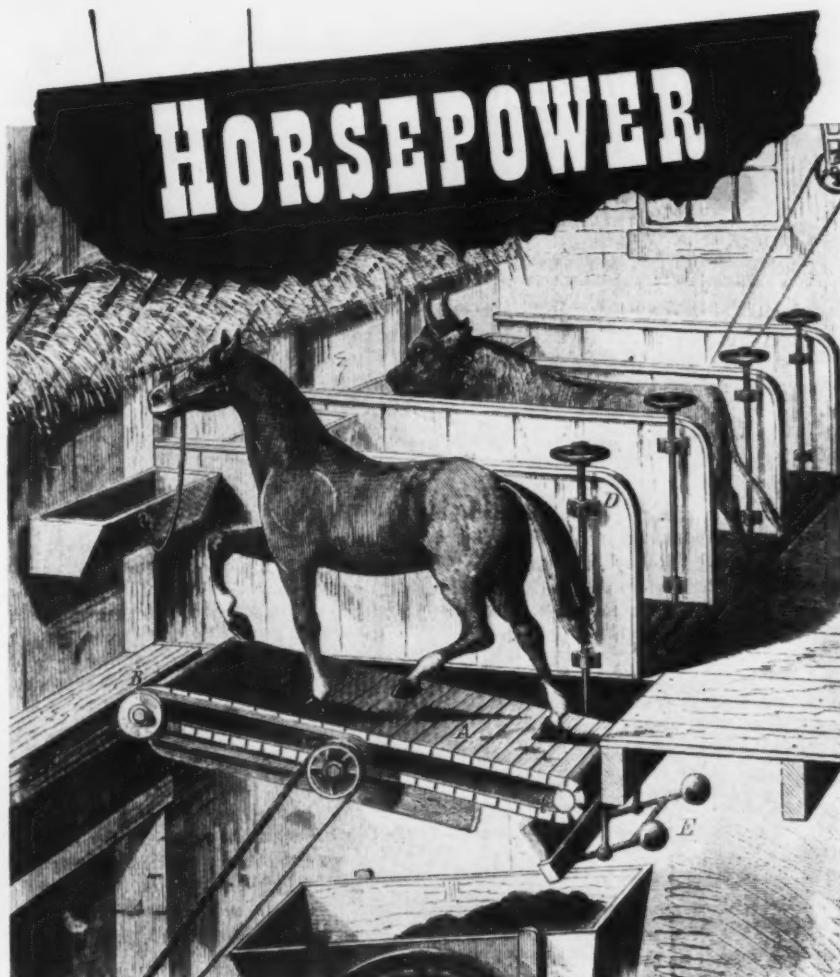
Liquid and gas-tight seams in the steel shells for 100-lb propane cylinders are copper-brazed by radiant gas burners in new automatic machines. A 0.140 in. shell, 36 in. long x 12 to 16 in. diam, tack-welded to size, is moved on a motor-driven carriage to the brazing po-



sition within the machine's framework, when the push-button operation is started. The carriage contacts a limit switch at the end of its rail, starting a time-relay that brings positioned radiant gas burners to the required temperature for brazing. During the 1.25 min heating-period an electrolytic copper brazing rod melts and flows uniformly between the fluxed surfaces of the 1-in. lap. At the end of the heating time the burners return to idling and the carriage moves to the starting position. Start-to-stop operation requires 1 min, 40 sec. *Selas Corp. of America.* For more information, check No. 39 on the postcard on p. 35.

Riffle Sampler

A new small riffle sampler conforming with ASTM D 271 was designed for the accurate sample splitting of coal and coke for laboratory analysis. It also reduces



Woodcut, 1880, courtesy The Bettmann Archive

Inventor Crawford claimed: "By this device a horse can clean his own stable, cut his own feed, run a thrasher, fanning mill, corn sheller, or corn mill, churn, saw or pump, wash buggies, clean windows, or wet down lawns, water stock, and put out fires."

History is full of examples of the literal application of horsepower to problems of power transmission, many of which were entirely impractical. Twin Disc has devoted 31 years to a program of continuous research and development in the field of power transmission.

Today there is a Twin Disc product that is the practical answer for every job where power must be applied . . .

in all types of construction, lumber, petroleum and farm equipment and in the marine and machine tool fields.

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin

(Hydraulic Division, Rockford, Illinois).

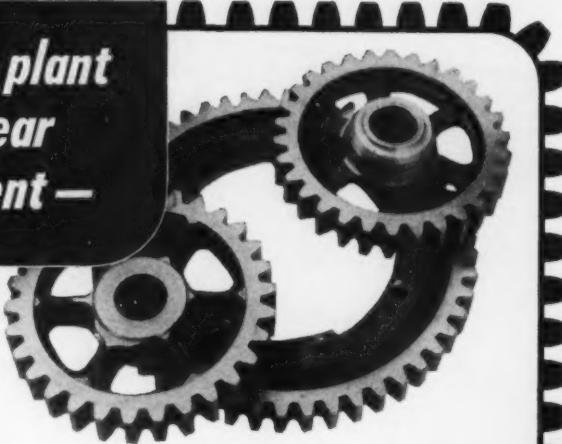


SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918

Continued

**Make our plant
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department —**

Heavy pitch
gears for con-
struction equip-
ment.



You can very frequently obtain quality gears and gear assemblies at a saving over present cost.

Our facilities include the most modern gear cutting machines of all types and many specialized machines arranged in batteries for volume precision production.

Expert engineering service is available to our customers for planning production on an efficient and economical basis. Write for a copy of Amgears Case Histories that illustrate the value of our engineering service.

For Purchasing Agents and Production Officials — Delivery Date Calculator free on request.

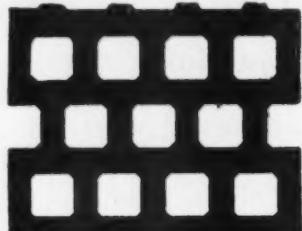
* **AMGEARS, INC.** 6633 W. 65th St.
Chicago 38, Ill. Phone—Portsmouth 7-2100

* **AM**—Accurately Made



Perforated metal screens

for any requirement



WITH facilities for producing any shape and size of perforations in any commercially rolled metal, of whatever gauge desired, Hendrick can furnish the most suitable form for a specific screening application.

To best meet certain requirements, Hendrick developed the "squarround" perforation illustrated. Other standard forms include round, square, hexagonal, diamond and slot perforations in hundreds of sizes of openings. Write for full information.



Perforated Metals
Perforated Metal Screens
Architectural Grilles
Metal Open Steel Flooring,
"Shur-Site" Treads and
Armorgrids

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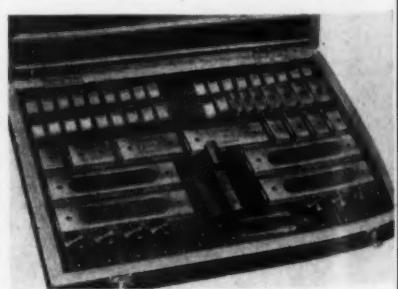
granular or powdered materials such as ore, sand, cement and chemicals. Sampling accuracy is pro-



moted by having a dust tight case, keeping the dust with the sample. Large door panels provide easy access. Smooth inner surfaces prevent clinging residue that could change the accuracy of the sample. Durable baked enamel finish prevents corrosion and rust. The apparatus is constructed of 18 and 20 gage sheet steel with sections welded or bolted together. Overall dimensions are 15 in. high x 11½ in. wide x 14 in. deep. *Precision Scientific Co.* For more information, check No. 40 on the postcard on p. 35.

Gage Blocks

One set of Webber HD gage blocks and fixtures serves as a height gage, scribe, snap gage, divider, and caliper. The blocks



are wrung together and locked with patented clamps, resulting in an easily applied gage, accurate to millionths of an inch. They are used for checking precision layout

and hole locations. Blocks and fixtures can be assembled in a few seconds. *Webber Gage Co.* For more information, check No. 41 on the postcard on p. 35.

Reversing Pumps

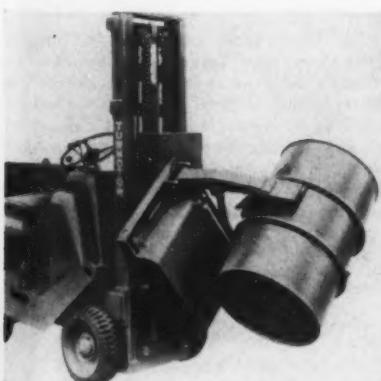
A new line of automatic reversing pumps designed for continuous operation against pressures up to



100 lb are offered in nine styles and sizes and contain a new type vane. They are available as complete pumps or as stripped models. *Brown & Sharpe Mfg. Co.* For more information, check No. 42 on the postcard on p. 35.

Revolving Barrel Grab

A hydraulically controlled revolving barrel grab for attachment to fork lift trucks lifts and transports open-end drums and discharges their heavy contents. A revolving carriage permits the container to be completely revolved in either direction. With a lifting



capacity of 2100 lb, the barrel grab is suitable for straight-sided drums from 15 to 30 in. diam. *Towmotor Corp.* For more information, check No. 43 on the postcard on p. 35.

Resume Your Reading on Page 39

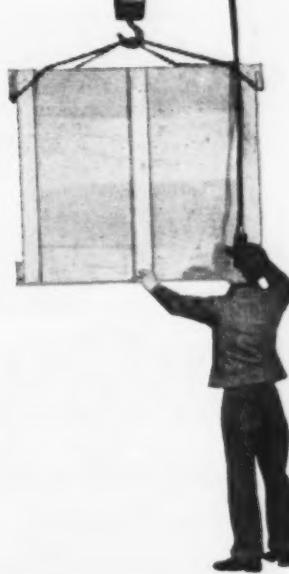


THE NORTHERN "TRAVELATOR"

You can cut handling costs substantially, increase the usefulness, and add years to the useful life of hand traveled crane equipment by converting with power travel bridge and pendant push button "Travelator" control.

This low cost unit is easy to install—your own mechanics can install it in a few hours. No dismantling of any crane parts, except to remove the old hand chain, is necessary or required.

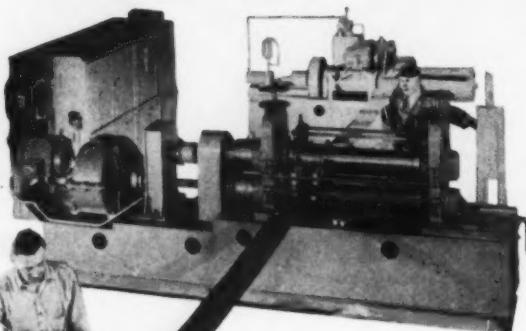
Let us send you Bulletin No. 140T showing the advantages and simplicity of this installation.



OVERHEAD ELECTRIC CRANES ★ AND HOISTS NORTHERN ENGINEERING WORKS ★ 2615 Atwater St., Detroit 7, Mich.

INCREASE YOUR PROFITS BY SALVAGING COIL ENDS

This PAXSON
SLITTER LINE
operating at
MCCARTHY STEEL
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No other strip steel slitter can match Paxson's performance, because Paxson is built to cut the coil without waste. Paxson gives you the EDGE; every pound of metal can be put to use. Easily adjusted, you can slit widths up from $\frac{1}{2}$ inch at a high rate of speed. Get the details today. Write, wire or phone if you want to talk to H. D.

Paxson personally. Paxson will be glad to discuss your problems with you.

**PAXSON
MACHINE CO.
Salem, Ohio**

PAXSON
GIVES YOU
THE EDGE!

**USE THEM INDIVIDUALLY
OR BOLT THEM TOGETHER**



Fig. 732
Pat'd and Pats. Pend.
Drawer is Extra

HALLOWELL

Ready-Made WORK BENCHES OF STEEL

Made in an assortment of standardized heights, widths and lengths, these "HALLOWELL" units can be used either individually or bolted together to form a continuous work bench of any desired length—thus flexibility is a money-saving feature not practicable with "nailed-together" wooden benches. Serviceable, ready-made "HALLOWELL" Work Benches of Steel have a pleasing, clean-cut appearance, too, and are ideal equipment for modernizing your shop. "HALLOWELL" Benches have smooth, long-wearing steel tops, are also available with heavy, high-grade laminated wood tops . . . or steel tops covered with "Tempered Preswood." The "HALLOWELL"—rigid as a rock—does not require costly bolting to the floor.

Other "HALLOWELL" Products include: "HALLOWELL" Foreman's Desks of Steel; "HALLOWELL" Tool Stands of Steel, with or without casters; "HALLOWELL" Steel Platform Trucks; "HALLOWELL" Stools and Chairs of Steel.

SPS STANDARD PRESSED STEEL CO.

BOX 523, JENKINTOWN, PENNSYLVANIA

"Serving Industry continuously since 1903 through Industrial Distributors"

F.
Dear

Editor

BACK NUMBERS AVAILABLE

We have a run of back issues of THE IRON AGE beginning with volume 93, 1914 to 1930, which we hope someone can use. It will be greatly appreciated if you could put us in touch with a library to which the volumes might be sent directly. Would any of the devastated European libraries be interested?

ELEANOR V. WRIGHT
Engineering Librarian
Chrysler Corp.,
Detroit 31, Mich.

Any reader interested in obtaining these bound volumes can write directly to Chrysler's Miss Wright.—Ed.

LEAD INFLUENCE

Kindly send some copies of the article "Influence of Lead on Behavior of Stainless Steel" by S. Bergh, which appeared in the July 14 issue.

G. KOONTZ
Metallurgist
Eastern Stainless Steel Corp.
Baltimore

HISTORY OF STEEL

Would you advise us as to literature covering the history of steelmaking? We have had many requests for this information from boys attending grade and high schools, and would appreciate your assistance.

J. B. BROWN
Eric Steel Co., Inc.
Philadelphia

The American Iron and Steel Institute, 350 Fifth Ave., New York 1, has literature specifically designed for the school level. "The Picture Story of Steel" is a 48-page book of pictures accompanied by brief descriptions of the manufacture of iron and steel in simple, non-technical language. "Steel From Mine to You" is an illustrated folder showing the principal steps in the making of iron and steel. A large diagram depicts the assembly of materials.—Ed.

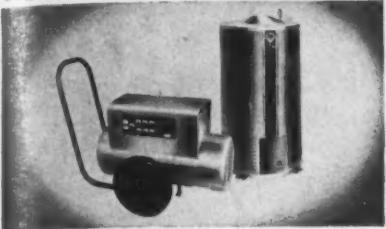
CUT WIRE SHOT

We are very interested in an article on cut wire shot which appeared in the July 21 issue. Could you please inform us of a source of supply for this material?

A. CLEGG
Equipment and Tool Controller
A. V. Roe Canada, Ltd.
Toronto

A source of supply is Precision Shot Co., 6432 Cass Ave., Detroit 2, Mich.—Ed.

NEW ARC WELDERS BOOST AC and DC PERFORMANCE



FASTER welding, better quality welds, lower power costs, and simplified maintenance are furnished by a new line of AC and DC arc welders introduced by Metal and Thermit Corporation.

Built-in capacitors for high power factor, wide current range for full rated output, and, fingertip, stepless current control for precise current setting are featured in the AC units. Available in 150 to 500 amp. models for manual arc welding, additional models for inert arc and automatic welding.

Full capacity, rugged duty DC arc welders are compact, light in weight—half the size and half the weight of older types—and are equipped with simplified current control, automatic electrode selector. Furnished in 150 to 400 amp. sets—motor driven, engine driven or belt drive.

Descriptive folder gives full particulars. Address Metal and Thermit Corporation, 120 Broadway, New York 5, N. Y.

ACCESSORY DIVIDENDS DECLARED



UNDERSCORING the importance of proper accessories to top welding performance, more and more fabricators are taking pains with selection of accessories. Speedier, lower cost, safer and improved welding are assured when such items as helmets, shields, holders, connectors, cleaning tools and protective clothing are carefully selected. And more and more fabricators—sold on M & T electrode and arc welder performance—are specifying the M & T line of "accessories to the perfect weld." For descriptive literature, address Metal and Thermit Corporation, 120 Broadway, New York 5, N. Y.

FATIGUE CRACKS

Continued from Page 20

steak medium rare, green salad, chocolate sundae and coffee, you are struck in the eye by an inch-high Chevrolet trademark with the legend, "America's choice for 18 years."

The implication, to us, is that next time you make the trip, you should drive a Chevrolet and make your own timetable. Or, if you have goods to ship, try a Chevrolet truck—cheaper than rail freight. Personally, we like medium rare dining car steaks and are unimpressed.

Welcome

Falling in with the commendable trend of publishing small informational brochures to be handed to visitors at the reception desk, Scully-Jones & Co., Chicago manufacturer of machine tool accessories, has added a wrinkle of its own in the listing of executive personnel.

After the surname of each man listed is the phonetic pronunciation, designed, as the folder says, "to help you avoid embarrassment through mispronunciation." You would know anyhow, probably, that J. A. Scully, president, pronounces his name SCULL-y, and that when you speak to executive vice-president H. D. Long you should say, "How do you do, Mr. LONG?" But we can see that, before the brochure, sales may have been lost through the wrong approach to purchasing agent G. Ptacek (TAY-check), and that fellow scientists might have required lengthy research before addressing tool engineer J. Lehde (LA-dy) properly.

We like particularly the frank historical sketch on Scully-Jones contained on the inside fold:

"Scully-Jones was founded in January 1912. If this is your first visit, let us give you a tip. Don't ask to see Mr. Jones! He hasn't been here since July—(July 1912, that is!). That was when he sold out his interest. The name has been continued because 'Jones' is a good name. There are a lot of wonderful people in this country by that name. (Besides, it costs money to have articles of incorporation amended.)"

As if that weren't enough to put you in a cordial mood, there's a suggestion that you have refreshments "on the house" in the company's cafeteria if there's a delay in seeing your man. If this gets to be a trend, we'll know that the damn Yankees have gone traditional Southern hospitality one better.

Resume Your Reading on Page 21

Get these new facts on Arc Welding to decision-makers in your plant

This easy-to-take 'Pack of Facts' makes the information crystal-clear

Today's arc welding offers the key men in your plant unprecedented opportunities to cut costs... improve quality... lick difficult production problems. Get them the latest facts on this versatile industrial tool now!

IT'S EASY—General Electric, as a service to industry, has prepared the facts for you in visual terms that are easy-to-take... linger in the memory.

Here's what the arc welding program offers:

1. A fact-packed manual, describing practical applications of electric arc processes...production feats. *Without sales bias*, it surveys the field authoritatively.
2. A full-color, sound motion picture, running thirty minutes, which shows arc welding increasing production and cutting costs in plants like yours.
3. Fully-illustrated highlights booklets, for individual study and review.

Convince yourself first—

We want you to be the judge of what these arc welding facts can do. That's why we offer business executives this chance to examine the *Arc Welding Manual* without cost.

Showings Cost You Nothing—With your manual, we'll tell you how to arrange for a FREE SHOWING of the film.



**FREE
TO BUSINESS
MANAGEMENT**

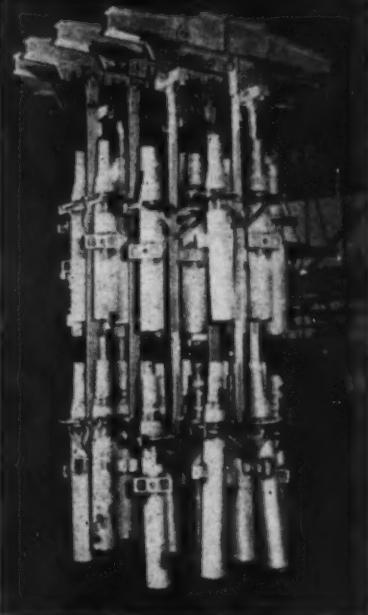
Attach
to your
business
letterhead

General Electric Co.
Section D684-2
Schenectady 5, N. Y.

Please mail me a sample copy of the G-E Arc Welding Manual without cost or obligation, with details on how I can arrange for a FREE SHOWING of the film. (Extra copies at regular manual price-\$1.25.)

Name _____ Title _____
Company _____
Street _____
City _____

GENERAL ELECTRIC



DOUBLE YOUR FURNACE CAPACITY!

That's exactly what Brown - Hutchinson engineering did when they replaced the fixtures formerly used for heat treating these sleeves!

Brown-Hutchinson skill in fabricating high alloy steels has paid dividends to their many clients throughout the industry. B-H scientific methods of design assure you long trouble-free service in heat treating fixtures, furnace parts, pickling equipment.

BROWN-HUTCHINSON FABRICATED EQUIPMENT COMBINES THE RIGHT ALLOY, WITH THE RIGHT DESIGN, TO BEST SUIT YOUR REQUIREMENTS.

BROWN-HUTCHINSON IRON WORKS

*Serving These Industries: Metal Processing,
Chemical & Petroleum, Paper & Textile.*

1831 Clay at G.T.R.R.

Detroit 11, Michigan

Quantity PRODUCTION of GREY IRON CASTINGS

*
ONE OF THE NATION'S
LARGEST AND MOST MODERN
PRODUCTION FOUNDRIES

ESTABLISHED 1866

THE WHELAND COMPANY
FOUNDRY DIVISION

MAIN OFFICE AND MANUFACTURING PLANTS
CHATTANOOGA 2, TENNESSEE



Fellows MACHINES AND TOOLS FOR GEAR PRODUCTION

The Fellows Gear Shaper Company, Springfield, Vt.

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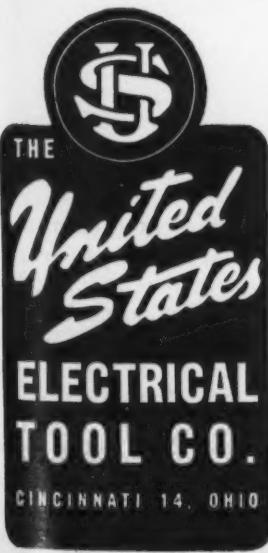


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Grinder**

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Grinder
Model XX**

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and at a price
that is right**

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Model 1000 has everything — visibility, positiveness, simplicity, lightness, toughness—it's dead to temperature changes and above all *accurate*. You'll like it when you see it and you'll like it more when you use it.

No other Indicating Snap Gage can match Model 1000 in usefulness. Five sizes cover the full range from 0 to 6". Think of the number of old-style conventional gages each Model 1000 can replace — think of the savings, too!

Federal Model 1000 All-Purpose Snap Gage does a *better* job at less cost. Its price will surprise and please you. Send for complete descriptive bulletin and price of this definitely modern Snap Gage—Federal Products Corporation, J1108 I Eddy St., Prov. 1, R. I.



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Adv. on
page 74
Feb. 3
Iron Age

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GLOBAL LETTER

REVIEW OF WORLD MARKETS



Continued from Page 28

Plans have been drawn for an entirely new mechanized rolling mill which is one of the most up-to-date of this kind for rolling thin sheets. The number of workers, which was formerly 1000, will be reduced to 600, with a higher capacity. These plans will be completed in the future by a four high reversible cold mill and by rebuilding the forging shop. The present capacity of 5000 tons monthly for this rolling mill will bring improvement in the French supply of thin sheets.

Brazil Restricts Imports While the Dollar Shortage Lasts

Rio de Janeiro—The law subjecting imports and exports to a system of prior licenses has been extended for 2 years from Sept. 30.

Providing exchange is available and that similar articles of equal quality are not produced in Brazil at a satisfactory price, prior licenses and priority of exchange will always be granted to import scientific and hospital equipment, machinery and equipment for Brazilian industries, railway material, chassis for commercial and collective transport vehicles, with accessories and spare parts, specific reconditioning and consumer materials ordered directly for their own use by national cinema and wireless transmitting and broadcasting companies, and apparatus for the prevention of accidents at work.

Raw Materials Given Priority

While the present dollar shortage lasts licenses for imports from the U. S. are subject to special restrictions. Lists of merchandise which may be imported are now published quarterly. The first list, issued in July, includes the above items.

For the guidance of American exporters it should be noted that the Bank of Brazil is giving priority to applications to import raw materials, machinery and equipment for agriculture and national industries. Among the items which may be imported this year, and which will probably appear in the next list are: Raw metallic minerals; anthracite and coal in bulk; steel bands for cotton baling; lead, tin, zinc and aluminum in bars, ingots, blocks, rods, coils; nickel, mercury and sulfur; galvanized sheets and plates; steel and iron cables and cords; mining and other industrial machinery and equipment.

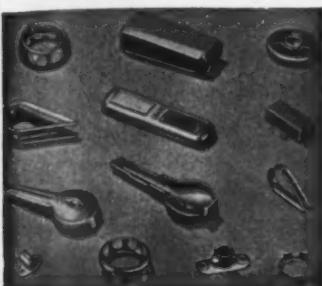
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Brand

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crank pin
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Lead, Stainless Steel and
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LATEST TYPE—Nearly New MACHINE TOOLS

BORING MILLS—Horizontal

CINCINNATI GILBERT 3½" bar, floor type, latest GIDDINGS & LEWIS #25T, 2½" Bar, latest type LUCAS 11" bar, Table Type, "Precision", latest NILES-BEMENT-POND 5", 8" bar, Floor type, M.D. UNIVERSAL 3" bar, high speed, latest type

BORING MILLS—Vertical

BULLARD 12" 6 Spin, Multi-Au-Matic, Type D, latest BULLARD 16" 6 Spin, Multi-Au-Matic, Type D, latest BULLARD 24", 36", 42" "Spiral Drive," Latest Type KING 62", 2 swivel heads, P.R.T. M.D. NILES 100", 2 swivel heads, P.R.T. D.C. Motor Dr.

DRILLS—Miscellaneous

AMERICAN 4" arm 11" col., "Hole Wizard", Latest LELAND & GIFFORD #2 LMS 6 spindle, Latest PRATT & WHITNEY 1Bx50" Deep Hole, Latest

GEAR CUTTING EQUIPMENT

BARBER COLMAN Type A Hobbler, Latest Type FELLOWS 61A, #61, 27, #7A, #75, #77, #Z, #622 High Speed Gear Shapers, latest type GLEASON 3", 12" straight bevel generator, Latest GLEASON 24", 37" Bevel Gear Planer, Motor Drive GOULD & EBERHARDT 12H Hobber, Latest Type GOULD & EBERHARDT 96H Hobber, with diff., m.d.

GRINDERS—Cyl.—Plain & Univ.

BROWN & SHARPE #1, 2, 3, 4 Universal, Latest LANDIS 4x12, Type H Plain Hyd., Latest Type NORTON 6x18", 10x27", 14x36", Type C, Plain, latest NORTON 6"x30", 10"x36", type C, Pl. Hyd., latest

GRINDERS—Miscellaneous

BARBER COLMAN #23, 4, hob sharpener, latest type CINCINNATI #2, #4 Centerless "Filimatic," latest HEALD 72A, 72AS "Gazematic" Internal, Latest HEALD 75A, 72AS, 72AS, 74, Internal, latest LANDIS #15 Centerless, Hydraulic, Latest Type

GRINDERS—Surface

BLANCHARD #11, 16" chuck, Latest Type HANCHETT Series 300, 12"x18" 16"x30" Centers, latest HEALD #22 Rotary, 12" chuck, latest type HEALD 25A—Rotary 16" and 30" chuck, hyd., latest

LATHES—Engine & Mfg.

AMERICAN 36"x36" centers, 2 carriages, motor dr. LODGE & SHIPLEY 14"x30", 16"x30" Centers, latest MONARCH 10"x20" centers, Model EE Timken, latest MONARCH 12"x30" Centers, 12x54" Centers, Model CK, Timken Bearing, Latest Type MONARCH 22"x456" centers, 3 carriages, Timken Bearing, Model CM, motor drive.

NILES 30x50" Boring, Timken, Latest Type PRATT & WHITNEY 16"x30" Centers, Timken, latest

LATHES—Turret

BARDON & OLIVER #5, #7, Timken, Latest Type FOSTER #4FU "Fastermatic," Timken, Latest GISHOLT #1L, #2L, #3L, Universal, Timken, Latest GISHOLT #3, #4 Univ., Timken, Latest Type JONES & LAMSON #5 Univ., Timken, Latest MOREY No. 30, No. 3, #4, Timken Bearing, latest WARNER & SWASEY #2A, #3A Univ., Timken, latest WARNER & SWASEY 4A Universal, Timken, Bar and Chucking (New 1947)

MILLING MACHINES—Plain

BROWN & SHARPE 2B, 3B, Timken, Latest Type CINCINNATI 4-36, 2-18 Hydromatic, Simplex, latest KEARNEY & TRECKER 1218, 1404, Latest type KEARNEY & TRECKER 2H, 3H, 4H, Timken, latest

MILLING MACHINES—Thread

LEES BRADNER 12"x54", Model HT, Latest Type MOREY 12"x36" and 60" centers, Latest Type PRATT & WHITNEY 6x60", Model C, Latest Type

MILLING MACHINES—Universal

BROWN & SHARPE 2A, 3A, Timken, Latest Type KEARNEY & TRECKER 2H, Timken, Latest Type VAN NORMAN #36, Timken, Latest Type

MILLING MACHINES—Vertical

BROWN & SHARPE #2B, Timken, Latest Type CINCINNATI #2, #4, Dial Type, Timken, latest type GORTON #8%D, high speed, latest type KEARNEY & TRECKER #3H, Timken, latest

PLANERS

BETTS (CONSOLIDATED) 84"x92"x16' 4 heads, Box Table, Power Rapid Traverse, D.C., M.D. BETTS (CONSOLIDATED) 108"x84"x50' 4 heads, Box Table, Power Rapid Traverse, D.C., M.D. NILES "Time Saver" 42"x42"x14', 3 heads, Rapid Traverse, A.C., vari-voltage drive, Latest NILES 168"x84"x42', 4 heads, Power Rapid Traverse, Box Table, D.C. reversing motor drive.

SCREW MACHINES—Automatic & Chucking

CONOMATIC 2½"—6 spindle, Latest Type GOSS & DELEEUW 6"x6¾" Auto. Chucker, Latest GOSS & DELEEUW 8" Auto. Chucker, 5 spin., Latest

MISCELLANEOUS

BARNES #172, 306H, 307, 307B Vertical Hone, Hydraulic, Self-Oiling, Latest Type CINCINNATI 1-30, 3-30, Duplex Vert. Surface Broach, Double ram, Model ER Hyd., Latest Type CINCINNATI Series 300, ½"x8"x6" Press Brake, M.D. HENRY & WRIGHT 50 ton Dieing Press, M.D. LAKE ERIE 500 ton Vertical Hydraulic Press, latest MICHIGAN 1708, 1712 Universal Reliever, latest VERNON #206, 10 gauge x 96" cap. Press Brake, latest

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THE CLEARING HOUSE

News of Used, Rebuilt and Surplus Machinery

Eastern used machinery business shows uptrend

**Steel and coal strikes hit machinery sales
Detroit chapter of MDNA discusses tax problems**

New York—Business in the used machinery field is picking up after a 7-month slump, according to eastern dealers. Most used and rebuilt machinery dealers in the Newark area report a general improvement in business since the first week of September.

New York dealers seem to be running about 3 weeks behind the Jersey trend. One New York dealer reported that the final quarter of 1949 will account for practically all of this year's business. Eastern dealers estimate that the slump during the first half of the year has caused the total business up to this point to run between 10 and 50 per cent behind last year's business, depending upon the dealer and the size and type of his operation.

Some Machinery Business Lost to Coal-Steel Strike

New York—Dealers find that the coal and steel strikes have been contributing factors in a substantial number of cases where sales have slowed up. One New York dealer reports that a turret lathe negotiation is being held

up until John L. Lewis and his coal miners are pacified.

A shop being liquidated in the Youngstown area sold only one machine after a 10-day concentrated sales effort. The lack of buyer response in this case was also said to be the direct result of the coal and steel crises.

Tax Problems Discussed At Detroit Meeting of MDNA

Detroit—The Detroit chapter of the Machinery Dealers National Assn. held its regular monthly meeting at the Fort Shelby on Oct. 11 with Robert Bryce, chairman of the group, presiding. More than 20 members were present.

The meeting was devoted to a discussion of tax problems. Following an address by a leading Detroit tax consultant, the members carried on a lively discussion of this timely subject.

New Jersey Dealers Report Increased Buying Activity

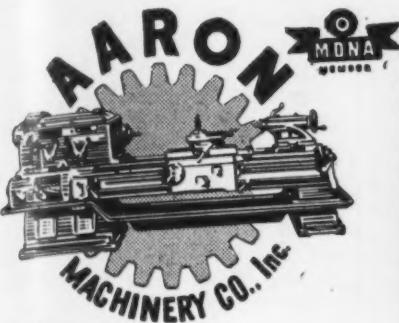
Newark—Used and rebuilt machinery dealers in this area report a favorable business outlook. Ad-

Turn to Page 140

MDNA CHAPTER SCHEDULES

Chapter	Date	Time	Place
Philadelphia	Tuesday, November 29	6:30 p.m.	Warwick Hotel
Chicago	Thursday, November 17	6:30 p.m.	Steak House
Detroit	Tuesday, November 15		Hotel Fort Shelby
Los Angeles	Tuesday, November 29		Los Angeles Elks Clt.
New York	Monday, October 31	6:00 p.m.	Cavanaugh's 23rd

THE CLEARING HOUSE



AUTOMATICS

Brown & Sharpe #200G, H.S. #4 & 6
Cincinnati 8 sp. 1½" cap.
New Britain Gridley 61—2½" 6 Sp.

BORING MILLS

Giddings & Lewis #20, #25T
Lucas 25T horiz.
Universal 8" horiz. equipped

DRILLS AND RADIALS

Cinci-Bickford Sup. Ser. 21", 24"
Revere Excelsior 21", Foote Burt 6 sp.
Nate Model E-5 Multi-Spindle, 14 Spindles
Candy-Otto 3" 9" col.
Carlton 8"-10" col.; Allen 6 sp.

ENGRAVERS

Garton #3U, #2, 2 dimensional, #L, 3 dimensional
Garton Cutter Grinders 375-2, 265-6
Dekel GI

GEAR EQUIPMENT

Fellowes #7, #72, #725 High Speed Shapers
Mikron Gear Hobber
Fellowes, Michigan, Gleason Checkers

GRINDERS, MISCELLANEOUS

Brown & Sharpe #5 cyl., 3" x 18"
Brown & Sharpe #1, #3 Univ. #13 Tool
Cincinnati #2 Centerless Filimat, 12 & 36 Univ.
Cina. 12 x 48" Univ., Gardner #226, 30" dia.
Covil #91A Univ. Tool & Cutter, Hammond #4
Head #2A3 Int. Centerless Sizemats, #1 Tool
Landis #4H Cyl. 4x12", Centerless, #6 Thread
Norton #2 Tool & Cutter, Type C, 6x30"
Oliver #510 Drill Pointer, Sellers #6, Black Diamond
Pratt & Whitney Radius #R6, K.O. Lee Tool
Porter Cable Belt WG8, G8; Gruber Int.

GRINDERS, SURFACE

Abrasives #1½ Wet Hand Feed, #33, #34, Vert.
Bleichard #18, 42" Mag. Chuck, #11-16" chuck
Brown & Sharpe #2
G. & L. #25, #33 Hyd. Feed
Hansen 300 series, 13x48" with chuck; Hammer #2
Mattison 14x16x48 with chuck; Hammer #2
Norton 8x18" Hyd., Atlantic 6x18" Power Feed
Rein #2A P.F. M.I.B., #2C Pope Spdi.
Pratt & Whitney 12x38" Vert.
Thompson Hyd. 8x10x18", 12x21x18"

LATHES

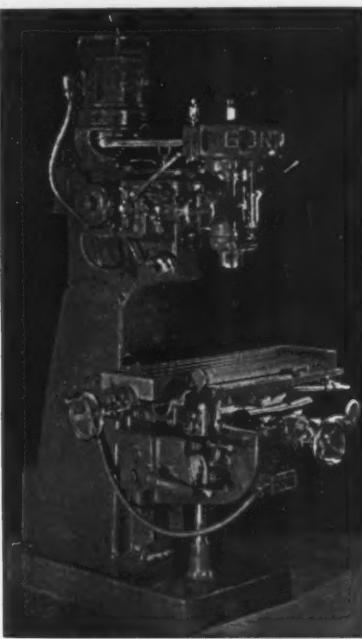
Hardinge Precision 9", 1" Collet Cap., Rivett
Hendey G.H. 16x30", Rel. Att., Bradford 16" x 30"
LeBlond Regal 15x30", 21x60", 10" x 3½", 18" x 48"
LeBlond Heavy Duty 16x33"
Lodge & Shipley 16x78" T.A., Collets, etc.

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Turret Lathe
Bullard SPIRAL DRIVE 54" Vertical
Turret Lathe
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10" x 48" Norton "C" Plain Grinder
70A Heald Internal Grinder
#174 Heald Internal Gap Grinder, 54"
#3H Kearney & Trecker Plain Miller
#3MS Cincinnati Plain Miller

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PELS 8" x 8" x 5/8" ANGLE SHEAR
EXCELLENT CONDITION.
PRICE \$1,750.00
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High Speed Vertical Mill

Monarch 10"x20" EE, 16x78 G.H., 12x30"
Sebastian 12"x4" G.H.
Sheldon 11"x24", Legam 10"x30"
South Bend 13x38", 14½"x8", 10x4, 9x3, 9x3½"

MILLS, PLAIN, UNIVERSAL & PROD.

Brown & Sharpe #200, 12, 21, #2A Univ., 2B PL.
Browne & Sharpe #4 Plain & Univ. Vert. Hd.
Cincinnati 2MH Univ.—1-12, 18, 2-18 Mfg.
Klein Owens #2V, 3B, 4B Hand Mills
Milwaukee #2H, 2H Univ. #2H, 2H Plain
Nichols Hand Vert. Hd.; U. S. Multimill
Sandstrand #20 Rigidmill; Whitney Hand Mills
Van Norman #12, 22L, 36; U. S. 1 & 2 sp.

MILLS, VERTICAL

Bridgeport Vert. Slotted, Hor. Sp.
Brown & Sharpe #2
Cincinnati 24"
Gerton #BD, #9 Plain, 8½D Duplication
Sia Jig Borer #MP-5
Index, Jackson, Vernon
Milwaukee 3H, 5H
Morey #12M Profiler 2 sp., P. & W. 12B
P. & W. 1½B Jig Borer, Moore Jig Grinder

PRESSES

Biss 675, 650, 645B HI-Production Presses
F. & M. #8 DBL Crank, Bed 42"x100"
Biss 19, 20, 21 OBI, 58, 62, 62A 162 OB.
Biss 4½ Double Action, Roll Feeds
Henry & Wright 75 Ton Dieing, 25 Ton

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HOT ROD MILL complete with Motor,
Controls and large quantity of extra equipment.

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4 CONTINUOUS NONFERROUS ROD BENCHES for Wet Drawing arr.
M.D. Complete with string-up machines and pointers.

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#425 Campbell Cutamatic Abrasive Saw, 4½" tubes,
3½" solid. 1942.
#401 Campbell Cutamatic Abrasive Cut-off Mash.
8" tubes solid. 1942.
#BP14 Lema Saw, High Speed Inserted Tooth, for
non-ferrous cap. 4" diam. bars. 1943.

F. H. CRAWFORD & CO., INC.
30 Church St. New York 7, N. Y.

HYDRAULIC EQUIPMENT

Cap.	Manufacturer	Platen	Stroke	Opening
300 Ton	Lake Erie	35x38"	38"	68"
600	Bald. S'thw'k	78x59"	22"	30"
500 D.A. H.P.M.		36x38"	24"	30"
(160 Cushion)				
1000	French Oil	53x42"	20"	50"
300	Brand New Watson Stillman Hobbing			
375 D.A. Elmes		84x44"	12"	42"
(60 Cushion)				
350	Verson	40x40	38"	72"
50	Dennison	23x20	18"	25"
150	Southwark	84x38	30"	2" to 4"

UP MOVING RAM PRESSES

30 & 100 Ton Stokes Molding Presses & Pumps
300 Ton Dunning & Boschert Molding Press
500, 800 Ton Waterbury-Farrel 3 & 4 Red
Presses, 6 & 6½ strokes
300 Ton Watson Stillman Press, 24x20" Platen
400 & 500 Ton Shaft Straighteners—Self Contained

All Hydraulic Equipment is completely engineered and checked by a competent staff, thus assuring reliability. Send us your Hydraulic problems.

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Air Hydraulics Presses—Arbor Presses #8C
Fame—Band Saws Kalamazoo—Drill Presses all sizes—Grinder Surface, Abrasive ±1½—Hydraulic Press Northern 20 Ton—Injection Molders, 1 ounce—Power Presses, OBI, 4½, 5, 7½, 10, 12, 16, 30 ton—Shaper, 7" Amco, 8" Shaperite—Shear, Sheldon 12"—Shears, Foot 22" to 8", 18 & 18 ga. Shears, Power, 3½" gauge to 10x19 ga.—Welders, Arc, Seam, Spot all sizes—Vert. Milling Attach. Holes, H.S.—Motors, Grinders, Buffers, all sizes

Thomas 80 Ton O.B.I. #7A, Z & H 30 Ton
Toledo 400 Ton Knuckle Joint
V. & O. #25S O.B.I. #102 O.B.I. Reducing, #8

TURRET LATHES

Acme 36" Bar & Chuck, Acme 6W Fox
Bardens & Oliver #3 1½" cap., #5, #2
Brown & Sharpe #1, 2F Hand
Gisholt #4, 5 Bar & Chuck, IL, Foster #3B
Hardinge ESM Second Operation
J. & L. 8A—Well Toolled
Moray #23, 1½" cap.
Oster #601 Rapiculation, well toolled
Warner & Swasey #5, 4, 3, 4A Universal

MISCELLANEOUS

Band Saw; Tannevitz #36M, DoAll ML
Bending Roll; Buffalo #0, ½ WR, Excelsior #14
Hackaw; Marvel #4B, 6A Automatic #6
Hardinge Tester; Clark
Hoher Micromat #H-1, Sunnen Riveters; HI Speed
Keyser, Davis, Babb, M & M
LaPonte #3L, Horiz. Hydr.
Press Brake; Chicago 335
Rauter; Onsrud #W240, 35
Saws; Wills, Catskill, Peerless, Kalamazoo
Shaper; Gould & Eberhardt 32" Univ. Industrial,
Lathe
Slotted; P. & W. 6" Vert. Shaper
Shaper; 8" Shaperite, 7" Atlas
Shear; Pepto 6x14 Ga.
Tappers; Bakewell #1, Haskins #2C, 3C
Thread Roller; Waterbury-Farrel #30 with Dies
Welders; Seam & Spot; Thompson, Taylor-Winfield,
Slatkey

BORING MILL, Vert. 14" Niles, 2 Hds., M.D.
BRAKE, Press 36" x ½", 40" throat, Late

BULLDOZER, No. 4 Williams & White

FORGING ROLL, No. 5 Ajax, Air Clutch, M.D.

HAMMERS, Pneumatic Nos. 48 & 68 Nazel

HAMMERS, Steam Drop, 2,000# Chambersburg

MILLER, Ingersoll, 36x8x16", 3 Hds., M.D.

MILLER, Vert. O.S. 72" x 72" x 16" Cinc. Hypro, '43

PRESS, Hyd., 250-Ton Chambersburg, 30" x 36"

PRESS, No. 59 Toledo, Str. 12", Bed 30" x 30"

PRESS, No. 59½ Toledo Str. 14", Bed 36" x 37"

ROLL, Bending, 10" x 1½" Wickes, Pyr. Type

SHEAR, Plate, 132" x 1½" Morgan, 26", Throat

SHEAR, Plate, S-6156 Pepto, 156" x 3½"

SHEAR, Plate, No. 4 H&J, cap. 10x5", M.D.

STRAIGHTENER, 17-Roll McKay, 54" x 4½"

STRAIGHTENER, 48" American, 13-Rolls, 2½"

UPSETTERS, 6" Ajax and 2" Acme

LANG MACHINERY COMPANY

28th St. & A.V.R.R. Pittsburgh 22, Pa.

LATHE—BRIDGEFORD, 32" x 21" C. to C. (old)

LATHE—GUN BORING, 64" x 65" (late)

PLANER—GRAY, 60" x 60" x 40" (Tolerance .003)

PRESS—TOLEDO, #185, 1440 tons, D.A.

SHEAR—R. D. Wood, 7" x 11", 18" gap

MAXWELL MACHINERY CORP.

1775 Broadway New York 19, N. Y.

PLAZA 7-3471

THE CLEARING HOUSE

CIMCO MACHINE TOOLS AT BARGAIN PRICES

BORING MILLS

Bullard 24" New Era, Vertical
Bullard, 54" Maxi Mill
Lucas #31, 3" bar, Horiz.
Cincinnati Gilbert 3½" bar, Horiz.
P & H Floor Type, Horiz, 4" spindle

DRILL PRESSES

Leland Gifford 24" Single Spindle
Coburn #4, Mfg. Type Single Spindle

RADIAL DRILLS

American 3½" Triple Purpose
American 5" Triple Purpose
Carlton 5", Ball Bearing
Fosdick 5" 14" col.

GRINDERS

Brown & Sharpe #13, Univ. & tool
Landis 4x12 Type H, Plain Cylindrical
Landis 10x24, Type C, Hydraulic
Head 70A Internal, (1941)
Excello 31L, Precision Thread
Norton 6x16, Surface
Thompson 12 x 16 x 16 Surface Grinder
ExCello #35L Precision Thread Grinder
Gallmeyer & Livingston #4 Univ. Tool Grinder

LATHES

Lodge & Shipley 14" x 30" centers, Late model
American Pacemaker 16" x 78" centers (1945)
Lodge & Shipley 18" x 8" bed, Selective Geared
Head
Sebastion Streamliner 20" x 8" centers
American 24" x 10" bed, G. H.
American 24" x 14", B speed, G. H.
American 42" x 14" bed, Internal face plate
drive, G. H.
Sidney 24" x 168" centers, equal to new
Niles Timesaver 30" x 10" centers

MISCELLANEOUS

Warner & Swasey #1A, Saddle type, Late model
Gisholt #3, Ram type, Univ.
Cincinnati 0-8 Vert. Miller
Lodge & Davis 24" x 24" x 6", Self Contained

GUARANTEED
MACHINERY

This Is A Partial List
Of Our Stock. Send Us
Your Inquiries.

**CINCINNATI MACHINERY
COMPANY, INCORPORATED**
209 E. Second Street
CINCINNATI 2, OHIO

HENRY AND WRIGHT DIEING MACHINE

75 Ton Henry and Wright Dieing Machine,
1½" stroke, double roll feeds, scrap cutter,
Reeves drive, 15 HP motor, stacking chutes.

No. 675 BLISS HIGH PRODUCTION PRESSSES

100 Ton, table size 37½" x 27", 18 HP, motor.
Reeves drive, open shunt height 17", stroke
2¾".

BLISS 645 B, 650

NORTON ROLL GRINDER
50" x 28", M.D., 54" swing, 40 HP.

AARON MACHINERY CO., INC.
45 Crosby St. New York 12, N. Y.
WO: 4-8233

Continued from Page 136

mitting, in general, that buying activity this year has been at a lower level than last, and that their worst month was July, most dealers agreed that they enjoyed a gradual pickup starting in September. They now report that business for the first part of October is as good as, and in some cases better, than the business activity of a year ago.

No particular item is experiencing all the sales demand, the full line of production machines, with all standard machine tools and presses reported moving.

Although admitting increased activity in the buying of used machinery, the dealers also have noted an increase in the number of auction sales. The fact that so many large, well established companies are going out of business has been surprising to the industry. Despite not being able to put a finger on the reasons, they are happy with the new-found activity.

Eastern Machinery Dealer Gets Additional Storage Facilities

New York—The Bennett Machinery Co. of New York City has recently acquired a 50,000 sq ft plot of ground in New Jersey for the erection of additional storage facilities. This site, situated in Clifton on the new route S-3, boasts a railroad siding and a brick and corrugated asbestos storage building that is nearing completion. To expedite the handling of used and rebuilt machine tools into and out of its storage area, a 10-ton overhead crane is being installed. Once in operation, these additional storage facilities are expected to result in more efficient handling of the coast-to-coast business and export trade.

Special Electrical Items Move

New York—A large dealer in electrical equipment reports that turnover is slow on many of the standard items such as motors and generators. Special equipment such as plating, alumilizing, and cleaning equipment are moving since many plants are being forced into modernization programs to retain their competitive positions.

Kling Double Angle Shear Cap, 6x6x1"
National High Duty Upsetting & Forging
Machines, guided overarm heading slide,
susp. slides 1½", 2", 3", 4" 5"

Ajax Upsetting & Forging Machines, susp.
slide 1½", 2½"

Ajax & Acme Upsetting & Forg. Machs. not
susp. slide, ¼", 1", 1½", 2½", 3"

Williams White Bulldozers #23, #4

Drop Hammers 800, 1000, 1200, 1500, 2500;

Trimming Presses #59½ Toledo Tie Rod;

other trimmers 55 to 200-tons

Bar Shears, open and guillotine ½" to 3½"
Rd.

Open Back Incl. Presses 8 to 60-tons

Solid Back Presses 20 to 100-tons

#94-A Toledo S.S. Double Crank Tie Rod
Press Bolster 40x36"

Bliss Knuckle Joint Press 250-tons

Nazel Air Forg. Hammer #6-B, Cap. 7" sq.

Bradley Hammers, Cushioned Handle, Upright

& Compact

Single and Double End Punches, wide variety
caps. & throat depths

Geo. Ohl Squaring Shear, Cap 10' ¼"

Ryerson Serpentine Throatless Shear ½"

Bending Rolls 8-½", 13-½"

Niles Plate Leveller 60"x½"

Landis Threading Mach. 1" two spin, lead

screw, Lanco Hds., single up to 4"

BOLT, NUT AND RIVET MACHINERY,
COLD HEADERS, COLD BOLT TRIMMERS,
THREAD ROLLERS, SLOTTERS,
HOT HEADERS AND TRIMMERS,
COLD AND HOT PUNCH NUT MACHINES,
POINTERS, THREADERS,
WOOD SCREW EQUIPMENT

Diamond Face Grinder, Segment Wheel 36"

Table 84x24", Hydraulic operated

Landis Motor Driven Pipe Threader 8"

American Wheelabrator 20x27, also 36x42

Southwark 400-ton Wheel Press

DONAHUE STEEL PRODUCTS CO.

1943 W. 74th Street, Chicago 36, Ill.

INDUSTRIAL EQUIPMENT

Scrap Baler, Logemann non-ferrous metal,
95% new, 5" x 5" x 14"

Press, Henry & Wright Dieing Machine—60

ton

Hydraulic Press H.P.M.—4 post, 24 x 24, 35

ton

Gap Straightening Press, 250 ton, excellent

condition

306½ Bliss Press, S.S., Gereed, 161 ton

Billet Breaker 8"—1945, weight 44 ton

THE ELYRIA BELTING

& MACHINERY CO.

Box 5 Elyria, Ohio

No. 7 Fellows Gear Shaper, H.S.

No. 3 Abrasive Surface Grinder, belt.

No. 13 B & S Universal Grinder, belt.

Davis 12" x 6" Gap Lathe.

D. E. DONY MACHINERY CO.

47 LAURELTON ROAD, ROCHESTER 9, N. Y.

THE IRON AGE



New Movie
Now Ready

Camera crew on location filming the electric-furnace sequence for industrial motion picture, "Alloy Steels"

"ALLOY STEELS"

Film Story of Controlled Production of Alloy and Special Steels

Bethlehem has completed a sound motion picture describing the production of alloy steels.

The film explains every phase of the process, beginning with the raw materials. It shows both electric and open-hearth furnaces in operation, as well as hot-rolling, billet preparation, heat-treatment, and cold-drawing. It deals extensively with highly-developed laboratory methods for maintaining quality on a mass-production basis.

"Alloy Steels" is intended for both technical and general audiences. It takes 45 minutes to show, and is available in either 16 or 35 mm. It is especially suitable for showing before such groups as:

Manufacturing and Industrial Companies
Jobbers and Dealers
Civic and Service Clubs
Colleges and Technical Schools
Technical Societies and Trade Associations

There is no charge for the use of "Alloy Steels" other than return shipping cost. Requests should be made at least three weeks prior to date needed. Address your requests to:

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BETHLEHEM, PA.

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BUSINESS STAFF

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Publisher

B. H. Hayes
Production Manager

O. L. Johnson
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Charles T. Post
Manager Circulation and Reader Service

J. R. Hight
Promotion Manager

Executive Offices
Chestnut and 56th Sts.
Philadelphia 39, Pa., U.S.A.
Editorial and Advertising Offices
100 E. 42nd St., New York 17, N.Y., U.S.A.

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Circulation Representatives
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Editorial

Laying It On The Line..... 7

News Interpretations

Newsfront	11
The Iron Age Summary	15
Global Letter	28
Machine Tool Highspots	34
On the Assembly Line	42
The Federal View	46
West Coast Progress Report	50

Special Features

Fatigue Cracks	22
Iron Age Introduces	24
Free Publications	36
New Production Ideas	37
The Economic Side, J. S. Lawrence	120
Dear Editor	167
The Clearing House	188

Technical Articles

Retaining Bearings by Swaging	79
Designing Tools for Cold Roll Forming	83
New Books	88
Finishing Automotive Die Cast Parts	89
Pickling Equipment for Severe Corrosive Conditions	92
Handling Emery Dust in Saw Glazing	94
Direct Reading Analysis of 18-8 Stainless	96
Centrifugally Actuated Fixture Eliminates Chatter	98
Units Speed Strip Steel Handling	100

Spot News of Industry

Domestic Iron Powder Industry Threatened	111
Strike Hits Tool and Die Industry Too	113
Industrial Shorts	114
Investors Eye Steel Common Stocks	115
Dates to Remember	118
Steel's Third Quarter Earnings	119

Markets & Prices

Market Briefs and Bulletins	135
Nonferrous Metals Outlook	136
Nonferrous Prices	137
Iron and Steel Scrap Market	138
Iron and Steel Scrap Prices	140
Comparison of Prices	142
Steel Prices	144
Pipe and Tubing Prices	145
Alloy Steel Prices	146
Warehouse Steel and Pig Iron Prices	147
Ferroalloy Prices	148

Index to Advertisers

199

Dear Customer

201